Appendix D

Air Quality/Greenhouse Gas Calculations

Desert Harvest

Riverside-Mojave Desert SCAQMD County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric
General Light Industry	52620.5	1000sqft
Industrial Park	130.7	1000sqft

1.2 Other Project Characteristics

Urbanization Rural **Wind Speed (m/s)** 2.6 **Utility Company** Southern California Edison

Climate Zone 10 **Precipitation Freq (Days)** 28

1.3 User Entered Comments

Project Characteristics - -

Land Use - 1208 acres for entire construction, 3 acres for O&M Facility

Construction Phase - Entire Construction Period, Phase 1 and Phase 2

Off-road Equipment - Average daily usage calculated based on equipment provided by the applicant

Off-road Equipment - Pump - Hydraulic Ram, Bore/Drill Rig - Pile Driver, Others - ATV, Power Screener, Cable Plow

Trips and VMT - Average employee trips - 100, Truck Deliveries - 56, Vendor Trips - 3 water trucks*8 hours and 30 pickup trucks*12 hours, 15 mph each

On-road Fugitive Dust - estimation

Grading - 35,000 tons of equipment and materials, 1208 acres for two-year constructions

Vehicle Trips - 16 employee commuting trips, 4 onsite pickup trucks, 3 water truck trips

Vechicle Emission Factors - passenger 86%, pick up truck 12%, water truck 2%

Vechicle Emission Factors - passenger 86%, pick up truck 12%, water truck 2%

Vechicle Emission Factors - passenger 86%, pick up truck 12%, water truck 2%

Road Dust - 160 mile / 7660 mile

Consumer Products - lowest EF possible

Area Coating - 250*(3/1211)

Landscape Equipment - -

Energy Use - no operation for 1208 acres

Water And Wastewater - no operation for 1208 acres

Solid Waste - no operation for 1208 acres

Construction Off-road Equipment Mitigation - -

Mobile Land Use Mitigation - -

Area Mitigation - -

Energy Mitigation - -

Water Mitigation - -

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2012	5.95	31.42	28.20	0.05	27.02	1.77	28.79	2.85	1.77	4.62	0.00	4,177.16	4,177.16	0.46	0.00	4,186.84
2013	16.99	112.40	90.58	0.16	79.45	6.10	85.56	7.68	6.10	13.78	0.00	14,254.80	14,254.80	1.34	0.00	14,282.87
2014	10.32	68.82	57.33	0.11	52.67	3.66	56.32	5.09	3.66	8.75	0.00	9,418.10	9,418.10	0.82	0.00	9,435.31
Total	**33.26**	**212.64**	**176.11**	**0.32**	**159.14**	**11.53**	**170.67**	**15.62**	**11.53**	**27.15**	**0.00**	**27,850.06**	**27,850.06**	**2.62**	**0.00**	**27,905.02**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2012	4.62	15.27	27.66	0.05	9.63	1.11	10.74	0.97	1.11	2.08	0.00	4,177.16	4,177.16	0.46	0.00	4,186.84
2013	11.84	45.80	95.93	0.16	28.23	3.61	31.84	2.57	3.61	6.18	0.00	14,254.80	14,254.80	1.34	0.00	14,282.87
2014	7.52	29.21	61.39	0.11	18.71	2.36	21.07	1.70	2.36	4.06	0.00	9,418.10	9,418.10	0.82	0.00	9,435.31
Total	**23.98**	**90.28**	**184.98**	**0.32**	**56.57**	**7.08**	**63.65**	**5.24**	**7.08**	**12.32**	**0.00**	**27,850.06**	**27,850.06**	**2.62**	**0.00**	**27,905.02**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.11	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Energy	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	406.40	406.40	0.02	0.01	408.95
Mobile	0.42	0.46	4.55	0.01	8.94	0.03	8.97	0.85	0.03	0.88	0.00	549.34	549.34	0.04	0.00	550.12
Waste						0.00	0.00		0.00	0.00	326.54	0.00	326.54	19.30	0.00	731.79
Water						0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**1.53**	**0.46**	**4.55**	**0.01**	**8.94**	**0.03**	**8.97**	**0.85**	**0.03**	**0.88**	**326.54**	**955.74**	**1,282.28**	**19.36**	**0.01**	**1,690.86**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.11	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Energy	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mobile	0.42	0.46	4.55	0.01	8.94	0.03	8.97	0.85	0.03	0.88	0.00	549.34	549.34	0.04	0.00	550.12
Waste						0.00	0.00		0.00	0.00	326.54	0.00	326.54	19.30	0.00	731.79
Water						0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**1.53**	**0.46**	**4.55**	**0.01**	**8.94**	**0.03**	**8.97**	**0.85**	**0.03**	**0.88**	**326.54**	**549.34**	**875.88**	**19.34**	**0.00**	**1,281.91**

3.0 Construction Detail

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use DPF for Construction Equipment

Use Oxidation Catalyst for Construction Equipment

Use Soil Stabilizer

Water Exposed Area

3.2 Material - 2012

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.84	0.00	0.84	0.32	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00
Off-Road	4.54	25.46	16.36	0.03		1.55	1.55		1.55	1.55	0.00	2,586.58	2,586.58	0.37	0.00	2,594.35
Total	**4.54**	**25.46**	**16.36**	**0.03**	**0.84**	**1.55**	**2.39**	**0.32**	**1.55**	**1.87**	**0.00**	**2,586.58**	**2,586.58**	**0.37**	**0.00**	**2,594.35**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.01	0.10	0.03	0.00	15.10	0.00	15.10	1.47	0.00	1.47	0.00	15.42	15.42	0.00	0.00	15.43
Vendor	0.55	5.02	2.71	0.01	10.37	0.17	10.54	1.03	0.17	1.20	0.00	827.77	827.77	0.02	0.00	828.14
Worker	0.85	0.84	9.09	0.01	0.71	0.05	0.76	0.03	0.05	0.08	0.00	747.39	747.39	0.07	0.00	748.93
Total	**1.41**	**5.96**	**11.83**	**0.02**	**26.18**	**0.22**	**26.40**	**2.53**	**0.22**	**2.75**	**0.00**	**1,590.58**	**1,590.58**	**0.09**	**0.00**	**1,592.50**

3.2 Material - 2012

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.33	0.00	0.33	0.12	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00
Off-Road	3.21	9.32	15.82	0.03		0.89	0.89		0.89	0.89	0.00	2,586.58	2,586.58	0.37	0.00	2,594.35
Total	**3.21**	**9.32**	**15.82**	**0.03**	**0.33**	**0.89**	**1.22**	**0.12**	**0.89**	**1.01**	**0.00**	**2,586.58**	**2,586.58**	**0.37**	**0.00**	**2,594.35**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.01	0.10	0.03	0.00	5.08	0.00	5.09	0.47	0.00	0.47	0.00	15.42	15.42	0.00	0.00	15.43
Vendor	0.55	5.02	2.71	0.01	3.51	0.17	3.68	0.35	0.17	0.52	0.00	827.77	827.77	0.02	0.00	828.14
Worker	0.85	0.84	9.09	0.01	0.71	0.05	0.76	0.03	0.05	0.08	0.00	747.39	747.39	0.07	0.00	748.93
Total	**1.41**	**5.96**	**11.83**	**0.02**	**9.30**	**0.22**	**9.53**	**0.85**	**0.22**	**1.07**	**0.00**	**1,590.58**	**1,590.58**	**0.09**	**0.00**	**1,592.50**

3.3 Building Construction - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	13.32	96.53	58.59	0.11		5.50	5.50		5.50	5.50	0.00	9,513.40	9,513.40	1.08	0.00	9,536.14
Total	**13.32**	**96.53**	**58.59**	**0.11**		**5.50**	**5.50**		**5.50**	**5.50**	**0.00**	**9,513.40**	**9,513.40**	**1.08**	**0.00**	**9,536.14**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.05	0.02	0.00	45.81	0.00	45.81	4.46	0.00	4.46	0.00	9.27	9.27	0.00	0.00	9.27
Vendor	1.32	13.48	6.77	0.03	31.49	0.45	31.94	3.13	0.45	3.58	0.00	2,509.90	2,509.90	0.05	0.00	2,510.89
Worker	2.35	2.34	25.21	0.03	2.16	0.15	2.30	0.09	0.15	0.24	0.00	2,222.24	2,222.24	0.21	0.00	2,226.58
Total	**3.67**	**15.87**	**32.00**	**0.06**	**79.46**	**0.60**	**80.05**	**7.68**	**0.60**	**8.28**	**0.00**	**4,741.41**	**4,741.41**	**0.26**	**0.00**	**4,746.74**

3.3 Building Construction - 2013

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	8.17	29.93	63.93	0.11		3.01	3.01		3.01	3.01	0.00	9,513.40	9,513.40	1.08	0.00	9,536.14
Total	**8.17**	**29.93**	**63.93**	**0.11**		**3.01**	**3.01**		**3.01**	**3.01**	**0.00**	**9,513.40**	**9,513.40**	**1.08**	**0.00**	**9,536.14**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.05	0.02	0.00	15.42	0.00	15.43	1.43	0.00	1.43	0.00	9.27	9.27	0.00	0.00	9.27
Vendor	1.32	13.48	6.77	0.03	10.65	0.45	11.10	1.05	0.45	1.50	0.00	2,509.90	2,509.90	0.05	0.00	2,510.89
Worker	2.35	2.34	25.21	0.03	2.16	0.15	2.30	0.09	0.15	0.24	0.00	2,222.24	2,222.24	0.21	0.00	2,226.58
Total	**3.67**	**15.87**	**32.00**	**0.06**	**28.23**	**0.60**	**28.83**	**2.57**	**0.60**	**3.17**	**0.00**	**4,741.41**	**4,741.41**	**0.26**	**0.00**	**4,746.74**

3.3 Building Construction - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	8.22	59.46	38.32	0.07		3.30	3.30		3.30	3.30	0.00	6,305.81	6,305.81	0.66	0.00	6,319.77
Total	**8.22**	**59.46**	**38.32**	**0.07**		**3.30**	**3.30**		**3.30**	**3.30**	**0.00**	**6,305.81**	**6,305.81**	**0.66**	**0.00**	**6,319.77**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.03	0.01	0.00	30.37	0.00	30.37	2.96	0.00	2.96	0.00	6.14	6.14	0.00	0.00	6.14
Vendor	0.67	7.90	3.69	0.02	20.87	0.26	21.13	2.08	0.26	2.34	0.00	1,662.15	1,662.15	0.03	0.00	1,662.71
Worker	1.43	1.43	15.31	0.02	1.43	0.10	1.53	0.06	0.10	0.16	0.00	1,444.00	1,444.00	0.13	0.00	1,446.69
Total	**2.10**	**9.36**	**19.01**	**0.04**	**52.67**	**0.36**	**53.03**	**5.10**	**0.36**	**5.46**	**0.00**	**3,112.29**	**3,112.29**	**0.16**	**0.00**	**3,115.54**

3.3 Building Construction - 2014

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.42	19.84	42.38	0.07		2.00	2.00		2.00	2.00	0.00	6,305.81	6,305.81	0.66	0.00	6,319.77
Total	**5.42**	**19.84**	**42.38**	**0.07**		**2.00**	**2.00**		**2.00**	**2.00**	**0.00**	**6,305.81**	**6,305.81**	**0.66**	**0.00**	**6,319.77**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.03	0.01	0.00	10.22	0.00	10.22	0.95	0.00	0.95	0.00	6.14	6.14	0.00	0.00	6.14
Vendor	0.67	7.90	3.69	0.02	7.06	0.26	7.32	0.70	0.26	0.96	0.00	1,662.15	1,662.15	0.03	0.00	1,662.71
Worker	1.43	1.43	15.31	0.02	1.43	0.10	1.53	0.06	0.10	0.16	0.00	1,444.00	1,444.00	0.13	0.00	1,446.69
Total	**2.10**	**9.36**	**19.01**	**0.04**	**18.71**	**0.36**	**19.07**	**1.71**	**0.36**	**2.07**	**0.00**	**3,112.29**	**3,112.29**	**0.16**	**0.00**	**3,115.54**

4.0 Mobile Detail

4.1 Mitigation Measures Mobile

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Mitigated	0.42	0.46	4.55	0.01	8.94	0.03	8.97	0.85	0.03	0.88	0.00	549.34	549.34	0.04	0.00	550.12
Unmitigated	0.42	0.46	4.55	0.01	8.94	0.03	8.97	0.85	0.03	0.88	0.00	549.34	549.34	0.04	0.00	550.12
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	0.00	0.00	0.00		
Industrial Park	78.42	78.42	78.42	1,070,433	1,070,433
Total	78.42	78.42	78.42	1,070,433	1,070,433

4.3 Trip Type Information

	Miles			Trip %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW
General Light Industry	0.00	0.00	0.00	100.00	0.00	0.00
Industrial Park	0.00	0.00	0.00	100.00	0.00	0.00

5.0 Energy Detail

5.1 Mitigation Measures Energy

Install High Efficiency Lighting

Percent of Electricity Use Generated with Renewable Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electricity Unmitigated						0.00	0.00		0.00	0.00	0.00	406.40	406.40	0.02	0.01	408.95
NaturalGas Mitigated	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NaturalGas Unmitigated	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU	tons/yr										MT/yr					
General Light Industry	0	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial Park	0	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		**0.00**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU	tons/yr										MT/yr					
General Light Industry	0	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial Park	0	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		**0.00**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	kWh	tons/yr				MT/yr			
General Light Industry	0					0.00	0.00	0.00	0.00
Industrial Park	1.39718e+006					406.40	0.02	0.01	408.95
Total						**406.40**	**0.02**	**0.01**	**408.95**

Mitigated

	Electricity Use	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	kWh	tons/yr				MT/yr			
General Light Industry	0					0.00	0.00	0.00	0.00
Industrial Park	0					0.00	0.00	0.00	0.00
Total						**0.00**	**0.00**	**0.00**	**0.00**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

No Hearths Installed

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.11	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unmitigated	1.11	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.15					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consumer Products	0.96					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscaping	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**1.11**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.15					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consumer Products	0.96					0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscaping	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**1.11**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

Use Reclaimed Water

	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr				MT/yr			
Mitigated					0.00	0.00	0.00	0.00
Unmitigated					0.00	0.00	0.00	0.00
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	tons/yr				MT/yr			
General Light Industry	0 / 0					0.00	0.00	0.00	0.00
Industrial Park	0 / 0					0.00	0.00	0.00	0.00
Total						**0.00**	**0.00**	**0.00**	**0.00**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	tons/yr				MT/yr			
General Light Industry	0 / 0					0.00	0.00	0.00	0.00
Industrial Park	0 / 0					0.00	0.00	0.00	0.00
Total						**0.00**	**0.00**	**0.00**	**0.00**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
	tons/yr				MT/yr			
Mitigated					326.54	19.30	0.00	731.79
Unmitigated					326.54	19.30	0.00	731.79
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	tons	tons/yr				MT/yr			
General Light Industry	0					0.00	0.00	0.00	0.00
Industrial Park	1608.62					326.54	19.30	0.00	731.79
Total						**326.54**	**19.30**	**0.00**	**731.79**

Mitigated

	Waste Disposed	ROG	NOx	CO	SO2	Total CO2	CH4	N2O	CO2e
Land Use	tons	tons/yr				MT/yr			
General Light Industry	0					0.00	0.00	0.00	0.00
Industrial Park	1608.62					326.54	19.30	0.00	731.79
Total						**326.54**	**19.30**	**0.00**	**731.79**

9.0 Vegetation

Desert Harvest

Riverside-Mojave Desert SCAQMD County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric
General Light Industry	52620.5	1000sqft
Industrial Park	130.7	1000sqft

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.6	**Utility Company**	Southern California Edison
Climate Zone	10	**Precipitation Freq (Days)**	28		

1.3 User Entered Comments

Project Characteristics - -

Land Use - 1208 acres for entire construction, 3 acres for O&M Facility

Construction Phase - Entire Construction Period, Phase 1 and Phase 2

Off-road Equipment - Average daily usage calculated based on equipment provided by the applicant

Off-road Equipment - Pump - Hydraulic Ram, Bore/Drill Rig - Pile Driver, Others - ATV, Power Screener, Cable Plow

Trips and VMT - Average employee trips - 100, Truck Deliveries - 56, Vendor Trips - 3 water trucks*8 hours and 30 pickup trucks*12 hours, 15 mph each

On-road Fugitive Dust - estimation

Grading - 35,000 tons of equipment and materials, 1208 acres for two-year constructions

Vehicle Trips - 16 employee commuting trips, 4 onsite pickup trucks, 3 water truck trips

Vechicle Emission Factors - passenger 86%, pick up truck 12%, water truck 2%

Vechicle Emission Factors - passenger 86%, pick up truck 12%, water truck 2%

Vechicle Emission Factors - passenger 86%, pick up truck 12%, water truck 2%

Road Dust - 160 mile / 7660 mile

Consumer Products - lowest EF possible

Area Coating - 250*(3/1211)

Landscape Equipment - -

Energy Use - no operation for 1208 acres

Water And Wastewater - no operation for 1208 acres

Solid Waste - no operation for 1208 acres

Construction Off-road Equipment Mitigation - -

Mobile Land Use Mitigation - -

Area Mitigation - -

Energy Mitigation - -

Water Mitigation - -

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2012	142.19	734.73	710.65	1.06	679.43	41.16	720.60	70.26	41.16	111.43	0.00	107,555.65	0.00	12.00	0.00	107,807.63
2013	133.72	865.08	742.11	1.23	659.89	46.76	706.65	63.62	46.76	110.39	0.00	120,878.86	0.00	11.46	0.00	121,119.47
2014	122.54	799.15	704.92	1.23	659.89	42.30	702.18	63.62	42.30	105.92	0.00	120,484.06	0.00	10.61	0.00	120,706.81
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2012	111.29	359.15	698.13	1.06	242.37	25.84	268.21	23.80	25.84	49.64	0.00	107,555.65	0.00	12.00	0.00	107,807.63
2013	94.27	354.63	783.09	1.23	234.74	27.67	262.41	21.20	27.67	48.88	0.00	120,878.86	0.00	11.46	0.00	121,119.47
2014	90.16	341.02	751.84	1.23	234.74	27.26	262.00	21.20	27.26	48.46	0.00	120,484.06	0.00	10.61	0.00	120,706.81
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	6.11	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Energy	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
Mobile	2.89	3.50	30.68	0.04	49.44	0.18	49.62	4.70	0.18	4.88		3,461.62		0.24		3,466.61
Total	**9.00**	**3.50**	**30.68**	**0.04**	**49.44**	**0.18**	**49.62**	**4.70**	**0.18**	**4.88**		**3,461.62**		**0.24**	**0.00**	**3,466.61**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	6.11	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Energy	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
Mobile	2.89	3.50	30.68	0.04	49.44	0.18	49.62	4.70	0.18	4.88		3,461.62		0.24		3,466.61
Total	**9.00**	**3.50**	**30.68**	**0.04**	**49.44**	**0.18**	**49.62**	**4.70**	**0.18**	**4.88**		**3,461.62**		**0.24**	**0.00**	**3,466.61**

3.0 Construction Detail

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use DPF for Construction Equipment

Use Oxidation Catalyst for Construction Equipment

Use Soil Stabilizer

Water Exposed Area

3.2 Material - 2012

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					19.54	0.00	19.54	6.63	0.00	6.63						0.00
Off-Road	105.52	592.31	380.48	0.66		36.03	36.03		36.03	36.03		66,325.41		9.48		66,524.56
Total	**105.52**	**592.31**	**380.48**	**0.66**	**19.54**	**36.03**	**55.57**	**6.63**	**36.03**	**42.66**		**66,325.41**		**9.48**		**66,524.56**

3.2 Material - 2012

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.17	2.46	0.75	0.00	380.38	0.09	380.47	37.02	0.09	37.11		395.44		0.01		395.62
Vendor	12.90	118.31	67.44	0.20	261.39	3.90	265.29	25.94	3.90	29.84		21,270.14		0.45		21,279.60
Worker	23.59	21.65	261.99	0.20	18.13	1.14	19.27	0.68	1.14	1.82		19,564.65		2.06		19,607.86
Total	**36.66**	**142.42**	**330.18**	**0.40**	**659.90**	**5.13**	**665.03**	**63.64**	**5.13**	**68.77**		**41,230.23**		**2.52**		**41,283.08**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.62	0.00	7.62	2.58	0.00	2.58						0.00
Off-Road	74.62	216.73	367.96	0.66		20.71	20.71		20.71	20.71	0.00	66,325.41		9.48		66,524.56
Total	**74.62**	**216.73**	**367.96**	**0.66**	**7.62**	**20.71**	**28.33**	**2.58**	**20.71**	**23.29**	**0.00**	**66,325.41**		**9.48**		**66,524.56**

3.2 Material - 2012

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.17	2.46	0.75	0.00	128.18	0.09	128.27	11.86	0.09	11.95		395.44		0.01		395.62
Vendor	12.90	118.31	67.44	0.20	88.44	3.90	92.35	8.68	3.90	12.58		21,270.14		0.45		21,279.60
Worker	23.59	21.65	261.99	0.20	18.13	1.14	19.27	0.68	1.14	1.82		19,564.65		2.06		19,607.86
Total	**36.66**	**142.42**	**330.18**	**0.40**	**234.75**	**5.13**	**239.89**	**21.22**	**5.13**	**26.35**		**41,230.23**		**2.52**		**41,283.08**

3.3 Building Construction - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	102.08	739.89	449.05	0.82		42.17	42.17		42.17	42.17		80,379.94		9.15		80,572.07
Total	**102.08**	**739.89**	**449.05**	**0.82**		**42.17**	**42.17**		**42.17**	**42.17**		**80,379.94**		**9.15**		**80,572.07**

3.3 Building Construction - 2013

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.03	0.43	0.14	0.00	380.37	0.02	380.39	37.01	0.02	37.03		78.32		0.00		78.35
Vendor	10.07	104.82	53.99	0.20	261.39	3.44	264.83	25.94	3.44	29.38		21,250.54		0.39		21,258.71
Worker	21.53	19.94	238.93	0.20	18.13	1.14	19.27	0.68	1.14	1.82		19,170.07		1.92		19,210.34
Total	**31.63**	**125.19**	**293.06**	**0.40**	**659.89**	**4.60**	**664.49**	**63.63**	**4.60**	**68.23**		**40,498.93**		**2.31**		**40,547.40**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	62.64	229.45	490.03	0.82		23.08	23.08		23.08	23.08	0.00	80,379.94		9.15		80,572.07
Total	**62.64**	**229.45**	**490.03**	**0.82**		**23.08**	**23.08**		**23.08**	**23.08**	**0.00**	**80,379.94**		**9.15**		**80,572.07**

3.3 Building Construction - 2013

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.03	0.43	0.14	0.00	128.17	0.02	128.18	11.85	0.02	11.86		78.32		0.00		78.35
Vendor	10.07	104.82	53.99	0.20	88.44	3.44	91.89	8.68	3.44	12.12		21,250.54		0.39		21,258.71
Worker	21.53	19.94	238.93	0.20	18.13	1.14	19.27	0.68	1.14	1.82		19,170.07		1.92		19,210.34
Total	**31.63**	**125.19**	**293.06**	**0.40**	**234.74**	**4.60**	**239.34**	**21.21**	**4.60**	**25.80**		**40,498.93**		**2.31**		**40,547.40**

3.3 Building Construction - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	95.01	687.57	443.11	0.82		38.12	38.12		38.12	38.12		80,379.84		8.48		80,557.84
Total	**95.01**	**687.57**	**443.11**	**0.82**		**38.12**	**38.12**		**38.12**	**38.12**		**80,379.84**		**8.48**		**80,557.84**

3.3 Building Construction - 2014

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.03	0.37	0.12	0.00	380.37	0.01	380.39	37.01	0.01	37.02		78.28		0.00		78.31
Vendor	7.76	92.79	43.02	0.20	261.39	3.03	264.41	25.94	3.03	28.97		21,231.01		0.33		21,238.04
Worker	19.74	18.42	218.67	0.20	18.13	1.14	19.27	0.68	1.14	1.82		18,794.93		1.79		18,832.62
Total	**27.53**	**111.58**	**261.81**	**0.40**	**659.89**	**4.18**	**664.07**	**63.63**	**4.18**	**67.81**		**40,104.22**		**2.12**		**40,148.97**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	62.64	229.45	490.03	0.82		23.08	23.08		23.08	23.08	0.00	80,379.84		8.48		80,557.84
Total	**62.64**	**229.45**	**490.03**	**0.82**		**23.08**	**23.08**		**23.08**	**23.08**	**0.00**	**80,379.84**		**8.48**		**80,557.84**

3.3 Building Construction - 2014

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.03	0.37	0.12	0.00	128.17	0.01	128.18	11.85	0.01	11.86		78.28		0.00		78.31
Vendor	7.76	92.79	43.02	0.20	88.44	3.03	91.47	8.68	3.03	11.71		21,231.01		0.33		21,238.04
Worker	19.74	18.42	218.67	0.20	18.13	1.14	19.27	0.68	1.14	1.82		18,794.93		1.79		18,832.62
Total	**27.53**	**111.58**	**261.81**	**0.40**	**234.74**	**4.18**	**238.92**	**21.21**	**4.18**	**25.39**		**40,104.22**		**2.12**		**40,148.97**

4.0 Mobile Detail

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	2.89	3.50	30.68	0.04	49.44	0.18	49.62	4.70	0.18	4.88		3,461.62		0.24		3,466.61
Unmitigated	2.89	3.50	30.68	0.04	49.44	0.18	49.62	4.70	0.18	4.88		3,461.62		0.24		3,466.61
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	0.00	0.00	0.00		
Industrial Park	78.42	78.42	78.42	1,070,433	1,070,433
Total	78.42	78.42	78.42	1,070,433	1,070,433

4.3 Trip Type Information

	Miles			Trip %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW
General Light Industry	0.00	0.00	0.00	100.00	0.00	0.00
Industrial Park	0.00	0.00	0.00	100.00	0.00	0.00

5.0 Energy Detail

5.1 Mitigation Measures Energy

Install High Efficiency Lighting

Percent of Electricity Use Generated with Renewable Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
NaturalGas Unmitigated	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU	lb/day										lb/day					
General Light Industry	0	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
Industrial Park	0	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
Total		**0.00**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**		**0.00**		**0.00**	**0.00**	**0.00**

5.2 Energy by Land Use - NaturalGas

<u>Mitigated</u>

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU	lb/day										lb/day					
General Light Industry	0	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
Industrial Park	0	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
Total		**0.00**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**		**0.00**		**0.00**	**0.00**	**0.00**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

No Hearths Installed

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	6.11	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Unmitigated	6.11	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.83					0.00	0.00		0.00	0.00						0.00
Consumer Products	5.28					0.00	0.00		0.00	0.00						0.00
Landscaping	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Total	**6.11**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**		**0.00**		**0.00**		**0.00**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.83					0.00	0.00		0.00	0.00						0.00
Consumer Products	5.28					0.00	0.00		0.00	0.00						0.00
Landscaping	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Total	**6.11**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**		**0.00**		**0.00**		**0.00**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

Use Reclaimed Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Vegetation

Appendix E.1

Water Supply Assessment

WATER SUPPLY ASSESSMENT

for

Desert Harvest Solar Project

Riverside County, California

in compliance with

California Water Code & Senate Bill 610

October 2012

Prepared for:

enXco, Inc.

Prepared by:

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1. INTRODUCTION

Senate Bill 610 (SB 610) was passed on January 1, 2002, amending California Water Code to require detailed analysis of water supply availability for certain types of development projects. The primary purpose of SB 610 is to improve the linkage between water and land use planning by ensuring greater communication between water providers and local planning agencies, and ensuring that land use decisions for certain large development projects are fully informed as to whether sufficient water supplies are available to meet project demands. SB 610 requires the preparation of a Water Supply Assessment (WSA) for a project that is subject to CEQA and meets certain requirements; each of which is discussed in detail in Section 4 of this WSA.

When a WSA is required per SB 610, it must examine the availability of an identified water supply under normal-year, single-dry-year, and multiple-dry-year conditions over a 20-year projection, accounting for the projected water demand of the proposed project in addition to other existing and planned future uses of the identified water supply, including agricultural and manufacturing uses.

SB 610 was not originally clear on whether renewable energy developments such as the proposed project are subject to SB 610 and require the preparation of a WSA. However, Senate Bill 267 (SB 267) was signed into law by California's Governor Brown on October 8, 2011, amending California's Water Law to revise the definition of "project" specified in SB 610. Under SB 267, wind and photovoltaic projects which consume less than 75 acre-feet per year (afy) of water are not considered to be a "project" under SB 610; subsequently, a WSA would not be required for this type of project. SB 267 does not state that renewable energy projects which use more than 75 afy are subject to SB 610 and must prepare a WSA; rather, it clarifies that those renewable projects which use less than 75 afy are not subject to such requirements. SB 267 also does not state that the 75-afy threshold cannot be interpreted to mean the average annual water usage over the lifetime of a project; however, for the purposes of this WSA, the most literal interpretation of SB 267 is utilized and it is therefore assumed that the 75-afy threshold refers to the quantity of water consumed during any 12-month period of a project.

Water requirements associated with the Desert Harvest Solar Project (DHSP, or "proposed project") are described in Tables WSA-1 (Construction Water Requirements) and WSA-2 (Operational Water Requirements); as noted in Table WSA-1, the proposed project would consume more than 75 afy of water during construction. Therefore, the proposed project is considered a "project" under SB 610, as clarified by SB 267. The proposed DHSP site overlies the Chuckwalla Valley Groundwater Basin (CVGB), which is proposed as a potential water supply for construction and operation of the project. Mitigation measures identified in Section 4.22 of the Environmental Impact Statement (EIS) for the proposed project require alternative water source(s) to be used where use of CVGB water would result in adverse environmental effects; however, in an effort to make conservative estimates regarding potential impacts of the proposed DHSP, this WSA assesses the CVGB as the project's primary water supply. Mitigation measures associated with the proposed project; as relevant to water supply reliability, are further discussed in Section 4.6 of this WSA (see "Supply Reliability Considerations").

This WSA has been prepared in compliance with California Water Code, as amended by SB 610 and SB 267. Water supply availability projections are provided in Section 4 (Water Supply Planning), under "Groundwater Supply Availability." There is no existing Urban Water Management

Plan (UWMP) or Integrated Regional Water Management Plan (IRWMP) which accounts for the proposed DHSP site and underlying groundwater resources (see Section 4.4); therefore, the water availability projections provided in this WSA rely on other available data sources and a series of reasonable assumptions, which are listed in Section 4.6. The steps followed to ensure compliance of this WSA with California Water Code are described in Attachment A (DWR Guidebook for Implementation of Senate Bill 610 and Senate Bill 221).

2. PROJECT DESCRIPTION

The proposed DHSP would be a 150-megawatt (MW) nominal capacity, alternating current (AC) solar photovoltaic (PV) energy-generating project. Primary components of the proposed project include a main generation area, operations and maintenance (O&M) facility, on-site substation, switchyard, and site security. The project would be located on lands administered by the U.S. Bureau of Land Management (BLM), Palm Springs–South Coast Field Office in Riverside County, approximately 5 miles north of Desert Center. The project would be located on 1,208 acres. Estimated construction water requirements for the proposed DHSP are provided below, in Table WSA-1.

Table WSA-1. Construction Water Requirements

Construction Component	Acre-Feet per Year	Total Acre-Feet
Dust Suppression	400 – 500	800 – 1,000
Concrete Batching[1]	0.51	1.02
Total	**400.51 – 500.51**	**801.02 – 1,001.02**

[1] The project would require 165 concrete truck deliveries during construction. Assuming that each truck would carry approximately 10 cubic yards of concrete, total concrete for the project is approximately 1,650 cubic yards. Per the 1997 Uniform Building Code (UBC 1997), the maximum water-to-concrete ratio should be no more than 0.5 (see Tables 19-A-2 and 19-A-4, "Maximum Water-Cementitious Materials Ratio, By Weight, Normal-Weight Aggregate Concrete" of (UBC 1997)). Assuming the weight of concrete is 150 pounds per cubic foot and the weight of water is 62.4 pounds per cubic foot, the total water required for concrete is 22,275 cubic feet, or approximately 0.51 acre-foot.

As shown in Table WSA-1, construction of the project would require an estimated 400.51 to 500.51 afy of water over the 24-month construction period, for a total of 801.02 to 1,001.02 acre-feet. In order to be conservative for the purposes of this analysis, it is assumed that construction of the proposed project would require 500.51 afy of water.

During operation and maintenance of the project, a double-pass reverse osmosis (RO) system and demineralization evaporation pond would be used to treat groundwater by decreasing concentrations of total dissolved solids (TDS) to a level acceptable for application on the panels. The RO system would produce up to approximately 20 gallons per minute (gpm) of low-TDS water, as well as approximately nine gpm of "reject water," or brine water that is too high in TDS content to be applied to the PV panels during washing activities. As such, approximately 45 percent of water produced by the RO system would be reject water. The reject water would be piped to an evaporation pond encompassing approximately one acre, where the liquid would evaporate, leaving salts and minerals that would be cleaned out and disposed of at an appropriate facility as needed. Estimated operational water requirements associated with the proposed DHSP are provided below, in Table WSA-2.

Table WSA-2. Operational Water Requirements

Project Component	Acre-Feet per Year
Panel Washing	18 – 27
Reverse Osmosis Reject Water	8 – 12
O&M Facilities and Fire-Fighting	0.02[1]
Total	26.02 – 39.02

1 - One permanent, above-ground 5,000-gallon water storage tank would be used for O&M tasks and facilities, including on-site fire-fighting; 5,000 gallons converts to approximately 0.02 acre-feet. It is anticipated that the storage tank would need to be re-filled on an annual basis.

As shown in Table WSA-2, operation and maintenance of the project would require an estimated 26.02 to 39.02 afy. In order to be conservative for the purposes of this analysis, it is assumed that operation and maintenance of the proposed project would require 39.02 afy of water.

As discussed in the introduction provided in Section 1, this WSA assesses water supply availability in the CVGB. Section 3 of this WSA provides a detailed discussion of CVGB characteristics and water balance, while Section 4 provides assessment of the CVGB supplies per matrices identified in SB 610, including analysis of water supply availability over 20 years (see Section 4.6). Conclusions of this WSA are provided in Section 5.

3. CHUCKWALLA VALLEY GROUNDWATER BASIN

The Chuckwalla Valley Groundwater Basin (CVGB) is located in eastern Riverside County, and encompasses an area of approximately 605,000 acres, or 904 square miles.

Climate in this area is characterized by high aridity and low precipitation. The region experiences a wide variation in temperature, with very hot summer months with an average maximum temperature of 108 degrees Fahrenheit (ºF) in July and cold dry winters with an average minimum temperature of 66.7 ºF in December (BLM 2011a).

Table WSA-3. Precipitation Data for Blythe Airport, California (1913–2008)

Month	Rainfall (inches) 1913 – 2008		
	Mean	Highest Month	Lowest Month
January	0.47	2.48	0
February	0.44	3.03	0
March	0.36	2.15	0
April	0.16	3.00	0
May	0.02	0.22	0
June	0.02	0.91	0
July	0.24	2.44	0
August	0.64	5.92	0
September	0.37	2.14	0
October	0.27	1.89	0
November	0.2	1.84	0
December	0.39	3.33	0
Total	3.59	n/a[1]	—

Source: BLM 2011a
1 - Annual totals for the lowest and highest rainfall months are not available because these extreme months were not recorded in the same year.

Average annual precipitation measures at Blythe Airport, west of the proposed DHSP site, is approximately 3.6 inches, with most rainfall occurring during the winter months or in association with summer tropical storms (BLM 2011a). Recharge to the CVGB from precipitation is discussed below, under "Safe Yield / Budget" (see "Recharge from Precipitation").

3.1 Basin Characteristics

The CVGB is located within the jurisdiction of the Colorado River Basin Regional Water Quality Control Board (RWQCB), and is subject to management direction of the Water Quality Control Plan (Basin Plan) for the Colorado River Basin (Region 7). For planning and reporting purposes, the Basin Plan divides Region 7 into seven major planning areas, on the basis of different economic and hydrologic characteristics (Colorado River Basin RWQCB 2006); the CVGB is located within the Hayfield Planning Area.

The CVGB is bounded by consolidated rocks of the Chuckwalla, Little Chuckwalla, and Mule Mountains on the south, of the Eagle Mountains on the west, and of the Mule and McCoy Mountains on the east. Rocks of the Coxcomb, Granite, Palen, and Little Maria Mountains bound the valley on the north. The presence of seismic faults is considered likely in some parts of the CVGB, but no barriers to groundwater flow have been identified. (DWR 2004a)

Water-bearing Features

Water-bearing formations in this groundwater basin include Pliocene to Quaternary age continental deposits divided into Quaternary alluvium, the Pinto Formation, and the Bouse Formation. These sediments are typical of basin fill deposits in the region, often containing layers of fine materials (clays and silts) central to the basin and away from the mountain fronts. Conversely, sediments tend to coarsen (sands and gravels with cobbles) around the basin edges. The maximum thickness of these deposits is about 1,200 feet, thinning toward the edges and to the western end of the basin. These deposits are generally considered unconfined, but some portions of the aquifer may be semi-confined in central areas of the basin due to the abundance of clay materials. All of the sediments filling this basin are considered part of the same aquifer.

The average specific yield of the upper 500 feet of unconsolidated sediments is estimated (in 1979) to be 10 percent (DWR 2004a). "Specific yield" is the ratio of the volume of water that saturated rock or soil will yield by gravity drainage to the total volume of the rock or soil (DWR 2011a). Specific yield is an important factor in water availability and is the factor that is used to convert saturated thickness (water table elevation) to the actual volume of water available. Although the porosity of a formation will remain relatively constant, factors which vary with changes in saturated thickness include specific yield, average local porosity, and the volume of water in storage (Buddemeier and Schloss 2000).

Recharge and Connectivity

The CVGB is recharged by percolation of runoff from the surrounding mountains, percolation of precipitation to the valley floor, groundwater inflow from the Pinto Valley, and groundwater inflow from the eastern portion of the Orocopia Valley (DWR 2004a; BLM 2011a). The California DWR's Bulletin 118 states that the CVGB also receives subsurface flows from the Cadiz Valley Groundwater Basin. However, hydrogeology experts disagree with this connection; due to a general lack of data to characterize this connection, the current consensus is that there is no hydrologic connection between the CVGB and the Cadiz Valley Groundwater Basin (Godfrey et al. 2012). Geologically or hydrologically connected groundwater basins are summarized below. The connection of each of these groundwater basins to the CVGB is described below and considered throughout the impact analysis presented in Section 4.20 of the EIS for the proposed project.

- **Pinto Valley Groundwater Basin.** Recharge to the Pinto Valley Groundwater Basin occurs through percolation of runoff from the surrounding mountains and precipitation to the valley floor and by underflow (DWR 2004b). The water that infiltrates the ground and reaches the water table percolates through the pore spaces in the water-bearing formations from points of replenishment toward points of discharge (USGS 2007). Under natural conditions, the only discharge from the Pinto Valley Groundwater Basin is underflow to the CVGB through unconsolidated deposits between exposures of consolidated rock of the Eagle and Coxcomb Mountains (USGS 2007). The water table in the Pinto Valley Groundwater Basin is deep enough that groundwater discharge from the transpiration of plants does not occur (USGS 2007). This basin is identified as Basin 7-6 by the California DWR.
- **Orocopia Valley Groundwater Basin.** This basin underlies the Orocopia Valley in central Riverside County, northeast of the Salton Sea. The western portion of the valley drains south and westward toward the Salton Sea, while the eastern portion of the basin drains eastward toward Hayfield Dry Lake and the CVGB. East-trending faults are located along the northern and southern boundaries of the Orocopia Valley Groundwater Basin; the North Chiriaco fault is inferred to extend eastward into Chuckwalla Valley and is known to be a partial barrier to groundwater movement in the Orocopia Valley Groundwater Basin. Natural recharge in this basin occurs from subsurface inflow and infiltration of runoff from the surrounding mountains and rainfall to the valley floor (DWR 2004d). This basin is identified as Basin 7-31 by the California DWR.

  The Metropolitan Water District of Southern California (MWD) has initiated a demonstration aquifer storage project in the Hayfield Dry Lake area, which is underlain by the Orocopia Valley Groundwater Basin. Nearly 60,000 acre-feet of Colorado River water have been placed in storage at this location. Work has been ongoing to develop production wells for water retrieval and to monitor aquifer conditions. This project is not fully active at this time. MWD has also studied a companion aquifer storage project in the northern and northeastern portions of the CVGB that are adjacent to the Colorado River Aqueduct. This project has not yet been implemented.
- **Cadiz Valley Groundwater Basin.** Sediments of the Cadiz Valley and the CVGB are in contact at the northern edge of the CVG,B between the Coxcomb and the Granite Mountains. Although the DWR has reported that Cadiz Valley Groundwater Basin contributes subsurface flow to CVGB, more recent work has reportedly confirmed that the Cadiz Valley Groundwater Basin does not contribute inflow to the CVGB (CEC 2009). Based on expert opinion and the most recent available data, for the purposes of this analysis it is assumed that the Cadiz Valley Groundwater Basin is not hydrologically connected to the CVGB.
- **Palo Verde Mesa Groundwater Basin.** The Palo Verde Mesa Groundwater Basin is in eastern Riverside County to the east of the McCoy and Mule Mountains. This basin is made up of alluvial deposits and Colorado River terraces. Natural recharge to this basin occurs from percolation of runoff from the surrounding mountains, percolation of precipitation to the valley

floor, groundwater inflow from the CVGB, and groundwater inflow from the Colorado River through its floodplain sediments (Palo Verde Valley Groundwater Basin). Groundwater movement is south and southeasterly into the Palo Verde Valley Groundwater Basin and the Colorado River. (DWR 2004e)

Groundwater Level Trends

Groundwater levels in the Hayfield Planning Area range from the ground surface to 400 feet below ground surface (bgs) (Colorado River Basin RWQCB 2006b). Specific to the CVGB, data show stable groundwater levels in the basin in 1963, and groundwater contours in 1979 indicate that groundwater moves from the north and west toward the gap between the Mule and McCoy Mountains at the southeastern end of the valley (DWR 2004a). The direction of groundwater movement is not anticipated to have changed since the aforementioned 1979 data; however, groundwater level trends may have changed substantially since 1963, due to development of the area and expanded groundwater uses. For example, data from wells within the Desert Center area show a period of water level decline from the mid-1980s through the early 1990s during periods of expanded agricultural operations when combined pumping exceeded 20,000 afy, well above historic water usage for the western portion of the basin (AECOM 2011). Since the mid-1990s, agricultural use of groundwater has declined and groundwater levels have partially recovered, at least in the western portion of the CVGB (AECOM 2011).

Groundwater level trends in the CVGB have been discussed in recent environmental analyses for other projects that could affect the basin. In comments provided on the Draft EIS for the Eagle Crest Pumped Storage Hydroelectric Project (Eagle Crest), the National Park Service (NPS), Joshua Tree National Park, has expressed concerns regarding the estimated budget for the CVGB, and the methodologies used in characterizing that budget (NPS 2010). The proposed DHSP is in the same groundwater basin as Eagle Crest, and the estimated groundwater budget used for the Eagle Crest analysis is used in part for the purposes of this analysis; therefore, the NPS' concerns regarding the estimated budget for the CVGB are addressed in this analysis.

The NPS notes that in general, groundwater levels in the CVGB appear to have been trending downwards for several decades. Most wells in the CVGB have not been used for monitoring data such as groundwater level trends since the 1980s; however, several wells have been used to collect groundwater data for the past 25 years, and this data show that groundwater level trends have either been fairly stable (for the eastern CVGB), dropping slowly but steadily (central CVGB), or rising slowly back towards pre-pumping groundwater levels (for the western CVGB). The proposed DHSP site is located in the western portion of the CVGB, where groundwater monitoring data suggests that groundwater levels have been recovering. It is noteworthy that most of the long-term monitoring wells in the CVGB are situated within agricultural or prison operations, complicating extrapolation of any drawdowns shown in those data to the CVGB as a whole due to the site-specificity of those wells' cones of depression (a "cone of depression" refers to drawdown which occurs in a well when it is pumped, causing a conical-shaped gradient in the surrounding aquifer that results from water flowing from areas of high to low pressure; when two or more cones of depression intersect each other, the effect on drawdown (increasing depth to groundwater) is combined and water table levels drop substantially). (NPS 2010)

Due to the site-specific effects that cones of depression have on groundwater monitoring efforts, and the lack of data from non-pumping wells in the CVGB, existing groundwater data is not sufficient to characterize groundwater level trends throughout the CVGB. For these same reasons, existing data is not sufficient to determine with certainty that groundwater level trends in the CVGB, or in a portion of the CVGB, have recovered substantially since the cessation of large-scale agricultural pumping in the late 1980s. Therefore, although recent data indicates that groundwater level trends may be recovering in the vicinity of the proposed DHSP site, as noted by the NPS and discussed above, it is conservatively assumed that groundwater trend analyses are inconclusive.

Storage Characteristics

The California DWR reports that in 1975 that the total storage capacity of the CVGB was understood to be 9,100,000 acre-feet, and that in 1979 the recoverable storage of this basin was understood to be 15,000,000 acre-feet (DWR 2004a). It is important to note that "storage capacity" does not reflect the actual amount of groundwater in storage, or the available groundwater supply, but rather is a function of the porosity of subsurface materials and the quantity of water that could theoretically be contained in the subsurface, based on this porosity. According to the DWR, the upper 100 feet of saturated sediments in the CVGB may have 900,000 acre-feet of groundwater in storage (DWR 2004a).

Safe Yield and Water Budget

The definitions of several terms which are critical to the analysis of groundwater conditions are listed below, as these terms are used throughout the following section.

- **Safe Yield** refers to the quantity of groundwater that can be withdrawn from a source or supply over a period of years without resulting in adverse effects such as depleting that source beyond its ability to be replenished annually, or impairing the native groundwater quality (SWRCB 2012). The safe yield may also be referred to as the "perennial yield."
- **Water Budget** refers to the annual difference in quantity between all inflows to a groundwater basin and all outflows from that basin, accounting for both natural and human-related sources and uses.
- **Overdraft** refers to the condition where a groundwater basin is drawn down beyond its ability to be replenished annually, or where the total production or outflow of water from all sources within a particular basin is less than the total recharge of water from all sources into that basin. Overdraft may occur on the short-term, where a groundwater basin recovers over a period of months or years, or it may be long-term and persistent, where a groundwater basin is consistently over-used and not provided the opportunity to recover. Overdraft conditions are not sustainable and can cause permanent harm to a groundwater resource; overdraft it is considered an adverse effect and is closely considered in this analysis.

There is currently a lack of long-term consistent groundwater monitoring data from throughout the CVGB, such as would be required to calculate safe yield, water budget, and overdraft (if present in the basin). Therefore, it is necessary to make reasonable assumptions in characterizing these aspects of the CVGB. A series of environmental analyses associated with other projects proposed for construction in this area have included estimates of safe yield and budget in the CVGB; the Draft EIS for the proposed DHSP included assumptions based on data and conclusions drawn from several of these analyses. In recent years, federal agencies including the NPS, the USGS, and the BLM have generated their own studies and analyses of the CVGB, some of this draw conclusions contrary to those used in the Draft EIS for the proposed DHSP. Therefore, this section has been revised to include discussion of all known professional opinions and conclusions regarding the current condition of the CVGB.

The DWR reports that in 1952, extractions from the CVGB totaled 11 acre-feet, increasing to 9,100 acre-feet in 1966, representing an increase of 82,627 percent over 14 years (DWR 2004a). As described under "Groundwater Level Trends," the DWR also reports stable groundwater levels in wells within the basin in 1963, suggesting that water use was being sustained by basin capacity at that time. The DWR reports no more recent estimates of safe yield for the CVGB. However, analyses of groundwater conditions in the CVGB have been prepared for other projects proposed in this area. In 1992, a safe yield amount of 12,200 afy was adopted in the EIS for the Eagle Crest Landfill Project. That estimate of safe yield is considered low because the calculation appears to have used an amount of recharge from precipitation that was based on recharge to only a portion of the basin (BLM 2011a). In 2011, a revised water budget was adopted in the EIS for the Palen Solar Power Project, based on a wider array of available data than the 1992 Eagle Crest EIS, including but not limited to: published literature, water budget information from the DWR, data compiled by the California State Prison Authority, and other available information, as discussed below (BLM 2011a). Table WSA-4 provides an estimated groundwater budget for the CVGB, based on data provided in studies prepared for other projects in the DHSP area, such as the Palen Project.

Table WSA-4. Estimated Budget for the CVGB, Based on Other Studies in the DHSP Area

Budget Components	Acre-Feet per Year
Inflow	
Recharge from Precipitation	9,448
Underflow from Pinto Valley and Orocopia Valley Groundwater Basins[1]	3,500
Irrigation Return Flow	800
Wastewater Return Flow	636
Total Inflow	14,384
Outflow	
Groundwater Extraction	–10,361
Underflow to Palo Verde Mesa Groundwater Basin	–400
Evapotranspiration at Palen Dry Lake	–350
Construction of the Desert Sunlight Solar Farm Project	–650[2]
Total Outflow	–12,361
Budget Balance (Inflow – Outflow)	**2,623**

Source: BLM 2011a; BLM 2011b; CEC 2009.

1 - As described under "Recharge and Connectivity," the DWR identifies that the CVGB receives underflow from the Pinto Valley and Cadiz Valley Groundwater Basins (DWR 2004a), while the BLM identifies that the CVGB receives underflow from the Pinto Valley and Orocoipa Valley Groundwater Basins (BLM 2011a). The DWR has not prepared a hydrologic budget for the CVGB or identified the quantity of underflow contributed to the CVGB from the Pinto and Cadiz Valley Groundwater Basins, whereas the BLM has prepared a hydrologic budget for the CVGB and identified the quantity of underflow contributed to the CVGB from the Pinto and Orocopia Valley Groundwater Basins. Therefore, due to the availability of quantitative data, this groundwater budget characterizes underflow from the Pinto and Orocopia Valley Groundwater Basins, but not the Cadiz Valley Groundwater Basin.

2 - Environmental baseline conditions are defined as the existing physical conditions at the time of publication of the Notice of Intent for the Desert Harvest Solar Project (September 15, 2011). The solar field associated with the Desert Sunlight Solar Farm project was under construction at the time of preparation of the Notice of Intent. Table 2.2-2 of the Final EIS prepared for the Desert Sunlight Solar Farm project (BLM 2011b) indicates that construction of the solar field requires a total water supply of 1,200 to 1,300 acre-feet, over a 26-month construction period, or roughly 600to 650 afy. In order to be conservative, an outflow of 650 afy associated with the Desert Sunlight solar field has been incorporated into the current groundwater budget for the CVGB to characterize baseline conditions.

Recharge associated with the potential Chuckwalla Groundwater Storage Program, described above in the discussion of "Recharge and Connectivity," is not accounted for in the groundwater budget summarized in Table WSA-4 because at the time of preparation of the Draft EIS, this program has not been implemented. Table WSA-4 indicates that the current total inflow to the CVGB is 14,384 afy and the current total outflow is 12,361 afy, resulting in a groundwater budget balance, or total outflow subtracted from total inflow, of 2,623 afy. This positive hydrologic budget balance indicates that, according to the assumptions used in constructing the balance shown in Table WSA-4, the CVGB is not currently affected by long-term overdraft conditions.

It is important to note that the estimates provided in Table WSA-4 are based on information and assumptions contained in studies conducted for other projects in the vicinity of the proposed DHSP. Independent analyses of the CVGB conducted in recent years have drawn conclusions which are contrary to the budget presented in Table WSA-4, particularly with regards to the rate of groundwater recharge. Therefore, the groundwater budget presented below in Table WSA-5 is based on conclusions drawn by the NPS and USGS in their independent analysis of the CVGB and surrounding basins.

Table WSA-5. Estimated Budget for the CVGB, Based on NPS and USGS Conclusions

Budget Components	Acre-Feet per Year
Inflow	
Recharge from Precipitation	2,060 – 6,125
Underflow from Pinto Valley and Orocopia Valley Groundwater Basins	953 – 1,906
Irrigation Return Flow	800
Wastewater Return Flow	636
Total Inflow	4,449 – 9,467
Outflow	
Groundwater Extraction	–10,361
Underflow to Palo Verde Mesa Groundwater Basin	–400
Evapotranspiration at Palen Dry Lake	–350
Construction of the Desert Sunlight Solar Farm Project	–650
Total Outflow	–12,361
Budget Balance (Inflow – Outflow)	**–2,894 – –7,912**

Source: NPS 2010; BLM 2012

Table WSA-5 indicates that the current total inflow to the CVGB ranges between 4,449 and 9,467 afy, while the current total outflow rate for the CVGB is 12,361 afy. The resulting balance shown in Table WSA-5 is negative, indicating groundwater overdraft conditions ranging between 2,894 and 7,912 afy.

A comparison of Tables WSA-4 and WSA-5 shows that the main differences in these water budget calculations occurs in the estimates of recharge from precipitation and recharge from underflow. Due to variability in expert opinion and associated estimations and conclusions, it is important to assess each component of the budget presented in Tables WSA-4 and WSA-5 in detail. Therefore, each component of the water budgets presented above is discussed in the following sections, and assumptions used to define the water budget components associated with both budgets provided above (Tables WSA-4 and WSA-5) are thoroughly defined in the following discussions. This WSA includes water supply availability projections for all water budget scenarios listed above in Tables WSA-4 and WSA-5.

Precipitation and Underflow

The California DWR has not published an estimated rate of recharge from precipitation to the CVGB, and estimates of recharge from precipitation that have been prepared in support of other projects in the area have had variable results. Similarly, there is also variability in estimates of recharge to the CVGB associated with underflow from the Pinto and Orocopia Valley Groundwater Basins, also as identified in environmental analyses for other projects in the area. Table WSA-6, below, shows the discrepancies in recharge quantities identified in the environmental analyses prepared for various other projects in the DHSP area, specifically as related to recharge from precipitation and from hydrologically connected groundwater basins (noting that the CVGB also receives recharge from irrigation and wastewater return flow, which are described below).

Table WSA-6. Comparison of Natural Recharge Estimates from Various Studies

Study	Recharge from Precipitation (afy)	Underflow from Pinto and Orocopia Basins (afy)	Total Recharge from Precipitation and Underflow
Genesis Solar Project EIS[1]	9,448	3,500	12,948
Eagle Mountain Draft EIR[2]	5,500	6,700	12,200
Palen Solar Project EIS[3]	8,588	3,500	12,088
Eagle Mountain Draft EIS[4]	6,125	6,575	12,700
Low – High (Average)	**5,500 – 9,448 (7,042)**	**3,500 – 6,700 (5,395)**	**12,088 – 12,948 (12,437)**

1 - Source: CEC 2009
2 - Source: SWRCB 2010
3 - Source: BLM 2011b
4 - Source: FERC 2010

As shown in Table WSA-6, estimates of recharge from precipitation and underflow that have been presented in other environmental analyses in the area range between 12,088 and 12,948 afy; this is a total difference of 860 afy, although the difference in precipitation estimates is 3,948 afy and the difference in underflow estimates is 3,200 afy.

Recharge from precipitation is estimated as a percentage of total precipitation in the Chuckwalla Valley. For instance, both the Palen and Genesis analyses assessed the quantity of recharge from precipitation by overlaying isohyetal maps over the Chuckwalla watershed boundaries and calculating the volume of average annual precipitation across the valley and bedrock portions of the watershed. Both analyses describe the Chuckwalla Valley watershed as being comprised of the Palen sub-watershed and the Ford sub-watershed, which receive total precipitation in the amounts of 156,000 afy and 159,000 afy, respectively; therefore, the Chuckwalla Valley watershed receives a total precipitation amount of 315,000 afy. (CEC 2009; BLM 2011b)

The Palen analysis estimated recharge from precipitation as 3, 5, and 7 percent of total incident precipitation in the watershed, noting that this equates to 8,588, 14,313, and 20,038 afy, respectively (BLM 2011b). The Genesis analysis estimated recharge from precipitation as a fraction of 2, 3, 5 and 10 percent of total incident precipitation in the watershed, noting that this equates to 6,300, 9,448, 15,750 and 31,500 afy, respectively (CEC 2009). Both analyses note that studies published by the USGS report 7 to 8 percent of precipitation falling on bedrock mountains in other arid basins goes to mountain front recharge, which would equate to 3 percent of the total precipitation that falls in the Chuckwalla Valley watershed; therefore, both analyses determine that 3 percent of total precipitation falling on the Chuckwalla Valley watershed is the lower estimate of recharge to the CVGB from precipitation. As noted above, total precipitation in the Chuckwalla Valley watershed equates to 315,000 afy; 3 percent of this estimate is approximately 9,450 afy. (CEC 2009; BLM 2011b)

Table WSA-6 also notes rates of precipitation and underflow recharge that were identified in the EIR and EIS for the Eagle Mountain Pumped Storage Project. The EIS and EIR for the Eagle Mountain Pumped Storage Project, upon which the NPS' original comments regarding natural recharge were made, were produced by the Federal Energy Regulatory Commission (FERC) and the California State Water Resources Control Board (SWRCB), respectively (FERC 2010; SWRCB 2010). In the EIS and EIR analyses, the FERC and SWRCB relied upon analysis of the CVGB conducted by GEI Consultants and presented in a Technical Memorandum included as an appendix to both the EIS and EIR (FERC 2010; SWRCB 2010). The GEI Technical Memorandum discusses two methods of calculating recharge to the CVGB:

- The Maxey-Eakin method of modeling natural groundwater recharge rates and patterns was applied to the CVGB, and produced a range of between 600 and 3,100 afy; and
- The MWD Review Panel method cited in a study of the Fenner Basin, north of the CVGB, indicates a recharge range of 7,600 to 17,700 afy for the CVGB (NPS 2010).

GEI Consultants selected the MWD Review Panel method for assessing recharge rates to the CVGB. As noted throughout this section, professional opinions often conflict regarding the characterization of groundwater resources. In this case, GEI Consultants determined that the MWD Review Panel was an appropriate method to use in characterizing the CVGB, while the NPS contended in comments on the Eagle Mountain EIS and EIR that the MWD Review Panel is unrealistic (NPS 2010); NPS concerns are discussed further below.

As shown in Table WSA-6, the Eagle Mountain EIS (FERC) and EIR (SWRCB) identified recharge from precipitation as 6,125 afy and 5,500 afy, respectively, and recharge from underflow as 6,575 afy and 6,700 afy, respectively. As noted in Table WSA-4, the Draft EIS for the proposed DHSP identified recharge from precipitation as 9,448 afy (based on data from the Genesis Solar Project EIS), and recharge from underflow as 3,500 afy (based on data from the Genesis EIS and the Palen EIS). As shown in Table WSA-6, 9,448 afy is the highest value for recharge from precipitation identified among the four listed analyses, while 3,500 afy is the lowest value for recharge from underflow.

According to the Genesis EIS and the Palen EIS, inflow to the CVGB from the Pinto Valley Groundwater Basin was estimated to be 3,173 afy, while inflow from the Orocopia Valley Groundwater Basin was estimated to be 1,700 afy (BLM 2011b; CEC 2009). Other studies indicate that subsurface flow to the CVGB from Orocopia Valley Groundwater Basin could be as low as several hundred afy (BLM 2011a). In order to account for this uncertainty, a combined subsurface inflow rate of 3,500 afy was assumed for both basins in the Draft EIS for the proposed DHSP. As shown in Table WSA-6 and noted above, 3,500 afy is the lowest value for recharge from underflow identified among the four listed analyses. In addition, although the DWR has reported that Cadiz Valley Groundwater Basin contributes subsurface flow to CVGB, more recent work indicates that the Cadiz Valley Groundwater Basin does not contribute inflow to the CVGB (CEC 2009). Therefore, for the purposes of this EIS, safe yield for the CVGB is assumed to include subsurface flow from the Pinto Valley and Orocopia Valley Groundwater Basins but not the Cadiz Basin. In total, the Draft EIS for the proposed DHSP assumed recharge from precipitation and underflow to be 12,948 afy, as listed in Table WSA-4.

As previously noted, there is substantial variation in expert opinion regarding the realistic rate of recharge to the CVGB from precipitation and underflow. In 2010, the NPS provided extensive comments on the EIS for the Eagle Mountain Pumped Storage Project, listed in WSA-6 as identifying recharge from precipitation at 6,125 afy and recharge from underflow at 6,575 afy, for a total quantity of natural recharge at 12,700 afy, a quantity that is similar to that used in the Draft EIS for the proposed DHSP (12,948 afy). In their comments, the NPS identified substantially lower estimates of recharge from precipitation, and contended that the budget for the CVGB is actually negative, indicating that the basin is in a state of overdraft.

The NPS' conclusions regarding the CVGB water budget are based on research conducted by the U.S. Geological Survey (USGS) on groundwater basins around the town of Joshua Tree. Specifically, the principal areas of interest for the USGS study were the Warren, Joshua Tree, and Copper Mountain Groundwater Basins (USGS 2004). None of these groundwater basins is adjacent to the CVGB, and neither the USGS nor the NPS conducted groundwater monitoring in the CVGB, the Orocopia Valley Basin, or the Pinto Valley Basin in support of this study. Rather, the NPS draws conclusions about recharge in the CVGB, Pinto Valley Groundwater Basin, and Orocopia Valley Groundwater Basin using the USGS methodologies and conclusions in assessing the Warren, Joshua Tree, and Copper Mountain Groundwater Basins, and extrapolating data for applicability to the proposed DHSP area (NPS 2010).

The USGS study involved collection of groundwater monitoring data from wells in the Warren, Joshua Tree, and Copper Mountain Groundwater Basins, and analysis of this data using a groundwater modeling program called INFILv3 (USGS 2004). As described in the USGS study (page 61), the INFILv3 watershed model results can have high uncertainty associated with the simplification of assumptions and uncertainty in model inputs, but was selected because it accounts for factors including climate, surface flows, and hydrologic processes in the upper unsaturated zone (the root zone), as well as physical characteristics of the drainage basin such as topography, surficial geology, soils, and vegetation; the INFILv3 model was considered by the USGS to have greater advantages than other methods of estimating recharge, such as empirical methods or geochemistry, because it accounts for a wide variety of natural factors (USGS 2004).

The results of the USGS study suggest that present-day groundwater recharge to basins "in the region of the Mojave Desert" is very limited, and that the majority of recharge to basins in this region may be coming from existing groundwater storage, not from natural replenishment (NPS 2010). Key results from the USGS study include the following:

- Sources of natural recharge to the Warren, Joshua Tree, and Copper Mountain Groundwater Basins are limited to infiltration of channelized stormflow runoff, groundwater underflow from neighboring basins, and septage infiltration;
- Infiltration of precipitation to depths below the root zone and subsequent groundwater recharge did not occur in the Joshua Tree area (to the west-northwest of the CVGB);

- Winter precipitation is the predominant source of groundwater recharge, based on Oxygen-18 and deuterium data collected in the Warren, Joshua Tree, and Copper Mountain Basins;
- Minimal recharge has reached the water table (associated with the Warren, Joshua Tree, and Copper Mountain Basins) since 1952, based on Carbon-14 data;
- Most recharge to the Warren, Joshua Tree, and Copper Mountain Basins likely occurs during unusually wet periods or isolated occurrences of extreme storms that are separated by relatively long (multi-year to multi-decade) periods of negligible recharge; and
- The vast majority of groundwater pumped from the Warren, Joshua Tree, and Copper Mountain Basins between 1958 and 2001 was removed from groundwater storage (as opposed to drawing on recharge), resulting in a 35-foot decline in measured groundwater levels in these basins (NPS 2010; USGS 2004).

As noted, the NPS extrapolated data and conclusions of the USGS study for applicability to the CVGB and contributing basins (Pinto Valley and Orocopia Valley Groundwater Basins), contending that the MWD Review Panel method used by GEI Consultants in support of the Eagle Mountain EIS and EIR grossly under-estimated recharge quantities, and the Maxey-Eakin methodology rejected by the GEI assessment provided a more realistic estimate of recharge. As previously noted, the Maxey-Eakin method identified recharge rates to the CVGB as a range of 600 to 3,100 afy, while the MWD Review Panel method identified a range of 7,600 to 17,700 afy. The NPS used results of the USGS study to derive a range of recharge coefficients, which were then applied to the Project study area basins (CVGB, Pinto Valley Groundwater Basin, Orocopia Valley Groundwater Basin), to identify an estimated range of total recharge of 3,300 to 6,000 afy; the NPS notes that this estimate is consistent with the upper range of the Maxey-Eakin approach, suggesting that the Maxey-Eakin method is more realistic than the MWD Review Panel method used in the Eagle Mountain analysis (NPS 2010).

The NPS's recharge coefficients were derived by taking the total annual recharge estimates for the whole Joshua Tree study area (1,090 acre-feet) and the basins located west of the Pinto Valley (sub-basin CM18, 244 acre-feet), and dividing them by their respective basin areas (159,801 acres and 64,994 acres), to produce recharge coefficients of 0.0068 acre-feet/acre and 0.0038 acre-feet/acre, respectively. The NPS applied these extrapolated recharge coefficients to the CVGB, the Pinto Valley Groundwater Basin, and the Orocopia Valley Groundwater Basin to identify estimated ranges of recharge to each of those basins, and to estimate rates of flow from the Pinto and Orocopia Valley Basins into the CVGB. The NPS' recharge estimates for the CVGB are provided below, in Table WSA-7.

Table WSA-7. Natural Recharge Estimates Proposed by the NPS, Extrapolated from USGS Data

Source of Recharge to the CVGB	Estimated Quantity (afy)
Precipitation (Within the CVGB)	2,060 – 6,125
Pinto Valley Groundwater Basin	624 – 1,248
Orocopia Valley Groundwater Basin	329 – 658
Total Recharge from Precipitation and Underflow	**3,013 – 8,031**

Source: NPS 2010; BLM 2012; Godfrey et al. 2012

As described in the table above, the NPS' approach of extrapolating USGS data to estimate the rate of groundwater recharge to the CVGB indicates that the CVGB receives between 3,013 and

8,031 afy of recharge from in-basin precipitation and from underflow associated with the Pinto Valley and Orocopia Valley Groundwater Basins. The NPS further notes that the total annual streamflow recharge rates simulated by the USGS may be two to ten times greater than the measured total annual stream flow, suggesting that the recharge values estimated by the INFILv3 model described in the 2004 USGS study may also be high by a factor of two to ten (NPS 2010). If it is true that the USGS model is skewed by a factor of two to ten, total annual recharge to the CVGB and the Pinto Valley and Orocopia Valley Groundwater Basins could be as low as 300 to 3,000 afy; this range is nearly identical to the range predicted by the Maxey-Eakin method, which is the method preferred by the NPS (NPS 2010). However, assuming that the USGS simulated streamflow recharge rates are reasonable, the NPS also adopts the groundwater recharge rates shown in Table WSA-7 as reasonable.

The range for groundwater recharge shown in Table WSA-7 is substantially lower than the values shown in Table WSA-6 (Comparison of Natural Recharge Estimates from Various Studies), which is why the water budget shown in Table WSA-4, which was used in the Draft EIS analysis for the proposed DHSP, is so different from the water budget shown in Table WSA-5, which has been incorporated to this analysis for the purposes of the Final EIS for the proposed DHSP. Table WSA-8, below, provides a side-by-side comparison of the recharge ranges identified by other studies in the DHSP area and by the NPS (based on the USGS 2004 analysis).

Table WSA-8. Comparison of Natural Recharge Estimates

Source of Estimate	Identified Range (afy)	Average (afy)
Other Studies in the DHSP Area	12,088 – 12,948	12,437
NPS Study (based on USGS)	3,013 – 8,031	5,522
Difference Between Expert Opinions	9,075 – 4,917	6,915

Table WSA-8 indicates vast differences in estimated rates of recharge to the CVGB from natural sources (precipitation and underflow). These differences are the result of several factors, including but not limited to the following: widely varying expert opinion on the subject of groundwater recharge, uncertainties inherent in the use of computer models to simulate groundwater behavior and characteristics, and a general lack of long-term groundwater monitoring data. In order to address the discrepancy shown in Table WSA-8 and appropriately characterize potential conditions in the CVGB, while presenting a full range of possible outcomes and consequences associated with the proposed DHSP, this Final EIS incorporates discussion of all expert opinions regarding the rate of natural recharge to the CVGB, and the effect that this value has on the overall water budget.

In further analysis of recharge to the CVGB, the NPS constructed comparative water balances for the CVGB over 60 years of historical pumping in the basin, using the recharge estimate identified by GEI Consultants for the Eagle Mountain analyses of 12,700 afy, in comparison to mean extrapolated lower recharge estimate of 3,013 afy identified by the NPS in aforementioned comments on the Eagle Mountain analyses. The NPS constructed these historic water balances using information presented in the Eagle Mountain EIS (FERC) and EIR (SWRCB). Through this comparative analysis, the NPS concluded that if the estimates of water stored in the CVGB identified in the Eagle Mountain analyses were true, the volume of water in storage in the CVGB should have increased between 1948 and 2007 by approximately 267,000 acre-feet, equating to a rate of 4,450 afy (NPS 2010). According to the NPS, such an increase would only be possible if one of the following occurred: average water level rise of approximately 18 feet across the basin; increased discharge by ET, and/or increased subsurface outflow from the CVGB. The NPS determined that none of these three indicators is evident in the CVGB, based on the best available information. (NPS 2010; Godfrey et al. 2012)

Conversely, using the NPS estimates for recharge to the CVGB, the volume of water in storage should have decreased between 1948 and 2007 by approximately 314,000 acre-feet, which roughly equates to an average water level decline of 21 feet across the basin. The NPS further justifies their adopted lower recharge estimates by citing what appear to be generally declining water levels across most of the CVGB over the last 60 years, coinciding with the conclusions of their historic analysis. The NPS concludes that their historical water balance analysis suggests that (1) recharge of 12,700 afy for the CVGB is likely too high, and (2) the CVGB overall may have been in an ongoing state of overdraft for several decades. (Godfrey et al. 2012)

As described throughout this section, there is a general lack of agreement among experts regarding the rate of groundwater recharge to the CVGB and connected groundwater basins. In the absence of comprehensive, long-term groundwater monitoring data collected throughout the CVGB, it is expected that there will continue to be academic disagreement on what the annual recharge rates and perennial yields are in the CVGB. Considering analysis produced by the NPS and based on USGS research, it is possible that annual recharge to the CVGB may be much lower than the recharge estimates identified in the Draft EIS for the proposed DHSP, and used in characterizing potential impacts associated with implementation of the DHSP. Therefore, the analysis of groundwater recharge and potential effects of the proposed DHSP on groundwater has been expanded to address all known professional opinions regarding groundwater recharge.

Irrigation Return Flow

The amount of applied irrigation water that returns to recharge a groundwater basin depends on the soil, crop type, amount and method of irrigation, and climatic factors. In water budget calculations for the Chuckwalla Planning Area in support of California Water Plan updates, an irrigation return flow of 9 to 11 percent was calculated for 1998, 2000, and 2001, respectively. A 10 percent return flow is therefore considered reasonable for deep percolation from irrigation. Current pumpage associated with irrigation return flow is estimated to be approximately 7,700 afy in the CVGB, accounting for 6,400 afy from agriculture, 215 afy from aquaculture pumping, and 1,090 afy from Tamarisk Lake. Therefore, return flows calculated using the 10 percent factor is approximately 800 afy. (BLM 2011a)

Wastewater Return Flow

Wastewater return flows from the Chuckwalla and Ironwood State Prisons contribute to the CVGB budget, as well as residential use particularly in the Lake Tamarisk development near Desert Center (BLM 2011a). Chuckwalla State Prison was constructed in 1988, and Ironwood State Prison became operational in 1994. These prisons use an unlined pond to dispose of treated wastewater, a large percentage of which is reported to infiltrate into the subsurface and recharge the CVGB (BLM 2011a). For the years 1998 through 2001, the California DWR Division of Planning and Local Assistance (CDWR-DPLA) reported that deep percolation of applied urban water in the Chuckwalla Planning Area (assumed to be wastewater return flow) was 500 to 800 afy. According to authorities at the State prison complex, approximately 600 afy of treated effluent recharges the CVGB. Water budget information for the proposed Eagle Crest Pumped

Storage Project indicates 795 afy of treated effluent are recharged by the prisons, but that populations at the prisons are projected to reduce by about 35 percent in order to alleviate overcrowding, and that associated recharge to the CVGB would also reduce to 600 afy (ECE 2008; FERC 2010). In order to be conservative for the purposes of this analysis, it is assumed that wastewater return flows from the prisons is approximately 600 afy, accounting for a reduction in prisoner population that could occur during implementation of the proposed project. An additional source of wastewater return flow in the basin is approximately 36 afy from the Lake Tamarisk development near Desert Center (BLM 2011a). With consideration to the Chuckwalla and Ironwood State Prisons, as well as the Lake Tamarisk development, total wastewater return flow to the CVGB is estimated to be 636 afy.

Groundwater Extraction

Groundwater pumping in the CVGB includes agricultural water demand, pumping for Chuckwalla and Ironwood State prisons, pumping for the Tamarisk Lake development and golf course, domestic pumping, and a minor amount of pumping by Southern California Gas Company. Most of the current groundwater pumping in the CVGB occurs in the western portion of the basin, near the community of Desert Center. Current groundwater pumping rates are estimated to be approximately 7,900 afy in the western CVGB and 2,605 afy in the eastern basin. Agricultural production is limited to the western portion of the basin, with the exception of a relatively limited amount of acreage that is associated with the State prisons. (BLM 2011a)

As described in a footnote to Table WSA-4, baseline environmental conditions relevant to the CVGB water budget include groundwater extractions associated with construction of the solar field for the Desert Sunlight Solar Farm project. Water demands associated with renewable energy projects which have been approved but are not yet under construction (at the time of preparation of this WSA) are identified under existing groundwater extractions because these projects have not yet initiated groundwater pumping and consumption. One exception to this is the Genesis Solar Energy Project, which was issued a Notice to Proceed on August 24, 2011, and therefore could have been under active construction by September 15, when the NOI for the DHSP was published. The first month of construction of the Genesis project would entail site preparation, which includes detailed construction surveys, mobilization of construction staff, grading, and preparation of drainage features (BLM 2010). It is reasonably assumed that if construction of the Genesis project initiated immediately upon issuance of the Notice to Proceed, construction activities requiring the project’s full water requirement of 1,368 afy would not have initiated within a few days due to the need to complete site preparation activities (noted above) which would not require a water source. Water demands associated with the Genesis project as well as other reasonably foreseeable projects in the CVGB are addressed in the water availability projections discussed in Section 4 of this WSA.

Underflow to Palo Verde Mesa Groundwater Basin

As described above in the discussion of “Recharge and Connectivity,” the CVGB contributes subsurface flow to the Palo Verde Mesa Groundwater Basin. Subsurface outflow to the Palo Verde Mesa Groundwater Basin was estimated in 1973 to be 400 afy, based on a cross sectional profile of the boundary between the Palo Verde Mesa Groundwater Basin and the CVGB which was derived using geophysical methods and regional data regarding groundwater gradients and hydraulic conductivity. This estimate was revised in 1986 based on the results of pump testing at

Chuckwalla State Prison, resulting in estimated outflow of approximately 870 afy. In 1990, outflow was estimated to be 1,162 afy based on return flow from prison wastewater disposal; however, the rationale for this adjustment was not provided. In 1994, gravity data was used to determine that the area through which discharge occurs is significantly more limited than previously thought due to the presence of a buried bedrock ridge. Therefore, for the purposes of this current estimate of groundwater budget for the CVGB, the most recent available outflow rate is considered to be 400 afy. (BLM 2011a)

Evapotranspiration at Palen Dry Lake

Groundwater elevation contour mapping suggests that groundwater may occur near the surface beneath approximately the northwestern 25 percent of Palen Lake. Therefore it is considered possible that a portion of Palen Lake is operating as a wet playa. Groundwater levels beneath the southeastern portions of Palen Lake, and a small ancillary playa located approximately one mile southeast of Palen Lake, were reported as being 20 to 30 feet bgs in 1979, suggesting that Palen Lake would be a dry playa at various times. (BLM 2011a)

Groundwater levels in a well located approximately 2 miles north of Palen Lake were reported to be approximately 20 to 25 feet bgs between 1932 and 1984. Surface elevation at Palen Lake 2 miles to the south of this well is approximately 460 feet above mean sea level (amsl), or 40 feet lower; it therefore appears possible that groundwater levels are very close to the ground surface beneath the northern portion of the playa. It is possible that an area in the northern portion of Palen Lake is discharging groundwater by evaporation as a wet playa. (BLM 2011a)

Field work conducted in December of 2009 included the implementation of borings to approximately 10 feet bgs in an identified salt pan area in the northwest portion of Palen Dry Lake. The moisture content of the soil was observed to increase with depth in both borings, and free groundwater was encountered at a depth of approximately 8 feet bgs in one of the borings. A depth of 6 to 10 feet bgs is generally the maximum depth of free water documented beneath discharging playas, suggesting that local groundwater could be shallow enough to discharge at the surface by capillary rise and evaporation. (BLM 2011a)

Groundwater discharge rates were estimated based on reported groundwater discharge rates at other playas, the area of identified salt accumulation in Palen Lake, and an evident episodic or intermittent nature of salt accumulation. Measured evapotranspiration rates at Franklin Lake Playa were used to form a basis for this estimate, calculated to be 38 to 41 cm/year (1.3 to 1.4 feet/year) based on the Energy-Balance Eddy-Correlation method, which is reported to be the most reliable method by the USGS. These rates are considered a conservative measure of evapotranspiration for active wet playa areas at Palen Lake. (BLM 2011a)

The total area of potential groundwater discharge at Palen Lake is estimated to be approximately 2,000 acres, with salt pan occupying approximately 700 acres of this total. Due to differences between Palen Lake and Franklin Lake Playa, a groundwater discharge rate that is approximately half that at Franklin Lake Playa was adopted for Palen Lake (approximately 0.0583 feet/acre/month of water), equating to approximately 350 afy over an area of 2,000 acres for three months of the year. (BLM 2011a)

3.2 Water Rights and Adjudication

The state of California does not have a comprehensive groundwater permit process to regulate the withdrawal of groundwater resources. Groundwater basins may be adjudicated by court decision, wherein a court determines the quantity of groundwater allotted to each landowner with respective rights to the underlying resource. Most groundwater basins in California are not adjudicated, which means that landowners may extract groundwater underlying their property without a permit process for regulation of groundwater use. Groundwater basins that have been adjudicated by court decision, of which there are 22 such basins in California, are subject to management by a court-designated Watermaster.

The CVGB is not an adjudicated basin, which means that overlying land owners may use the groundwater on an "equal and correlative" basis, such that all property owners above a common aquifer possess a shared right to reasonable use of the aquifer, and a user cannot take unlimited quantities without regard to the needs of other users (BLM 2001). Surplus groundwater may be appropriated for use on non-overlying lands, provided such use will not create overdraft conditions; permits are not required for the use of underlying groundwater, but the appropriation of surplus groundwater is subordinate to the correlative rights of overlying users (BLM 2001).

As noted above, there have been no court actions involving water rights or water use in the CVGB. In accordance with a 2003 decision by the SWRCB identified as Water Rights Order (WRO) 2003-0004, which provided interpretation of California Water Code §1200, State jurisdictional waters include those which meet the following criteria: (1) A subsurface channel is present; (2) The channel has relatively impermeable bed and banks; (3) The course of the channel is known or may be determined by reasonable inference; and (4) Groundwater is flowing within the channel (SWRCB 2003). Waters that are identified as State jurisdictional waters are appropriated for use by state-issued permits. If it is determined that groundwater in the CVGB is State jurisdictional, such as if it is considered a subsurface channel as described in WRO 2003-0004, the CVGB would be managed by the SWRCB and use of groundwater from the CVGB would be determined through appropriation. Until determination of State jurisdiction is made, the CVGB will be governed by the equal and correlative doctrine described above.

3.3 Groundwater Management

No comprehensive groundwater management plan currently exists for the Chuckwalla Valley Groundwater Basin. However, plans and actions have been proposed and/or implemented in the area to address groundwater management and supply reliability are discussed in this section.

Riverside County General Plan

The Riverside County General Plan includes policies to facilitate groundwater recharge. As described in the General Plan, most groundwater basins within Riverside County store local and imported water for later use to meet seasonal and drought-year demands. Under these groundwater recharge programs, groundwater is artificially replenished in wet years with surplus imported water. Water is then extracted during drought years or during emergency situations. In order to facilitate groundwater recharge, the policies listed below are identified in the General Plan. (Riverside County 2008)

- OS 4.1 Support efforts to create additional water storage where needed, in cooperation with federal, state, and local water authorities. Additionally, support and/or engage in water banking in conjunction with these agencies where appropriate, as needed.
- OS 4.2 Participate in the development, implementation, and maintenance of a program to recharge the aquifers underlying the County. The program shall make use of flood and other waters to offset existing and future groundwater pumping, except where:
  a) groundwater quality would be reduced;
  b) available groundwater aquifers are full; or
  c) rising water tables threaten the stability of existing structures.
- OS 4.3 Ensure that adequate aquifer water recharge areas are preserved and protected.
- OS 4.4 Incorporate natural drainage systems into developments where appropriate and feasible.
- OS 4.5 Retain storm water at or near the site of generation for percolation into the groundwater to conserve it for future uses and to mitigate adjacent flooding.
- OS 4.6 Use natural approaches to managing streams, to the maximum extent possible, where groundwater recharge is likely to occur.

Also as described in the General Plan for Riverside County, groundwater banking is a key factor for meeting future water supply needs in southern California. Historically, groundwater extractions have exceeded natural recharge in this region, resulting in declining water levels and water quality. Using groundwater basins for water banking during wet periods will help alleviate southern California's water supply problems. (Riverside County 2008)

Chuckwalla Groundwater Storage Program

"Conjunctive use" refers to the deliberate combined use of groundwater and surface water; conjunctive use means actively managing groundwater resources as an underground reservoir. During wet years, surface water is stored underground by recharging the aquifers with surplus surface water and during dry years, the stored water is available in the aquifer system to supplement or replace diminished surface water supplies. (DWR 2011b)

The *Draft Colorado River Water Use Plan* describes that the MWD has studied a groundwater storage project in the CVGB called the Chuckwalla Groundwater Storage Program as part of an effort to increase its reliable water supply; this plan would store Colorado River water in years when water is available and delivering it to water demand areas when needed (CRBC 2000). The Chuckwalla Valley is adjacent to the Hayfield Valley and has the capacity to store up to 1.2 million acre-feet of water in the northern portion of the valley (CRBC 2000). The Chuckwalla Groundwater Storage Program is anticipated to deliver up to 150,000 afy in additional water supplies (Moute & Polyzoides Architects and Urbanists et al. 2008).

Cadiz Valley Water Conservation, Recovery, and Storage Project

As described in Section 3.1 (see "Recharge and Connectivity"), the CVGB receives subsurface inflow from the Cadiz Valley Groundwater Basin (DWR 2004a). The Cadiz Valley Water Conservation, Recovery, and Storage Project (Cadiz Water Project) is designed to actively manage the groundwater basin underlying a portion of the Cadiz and Fenner Valleys in order to maximize long-term water supply reliability. The Cadiz Water Project would be developed in two phases: 1) the Conservation and Recovery Component, and 2) the Imported Water Storage Component. The Santa Margarita Water District (SMWD), along with other Project Participants, would implement the Project in partnership with Cadiz Inc. (Cadiz), a Delaware corporation that owns approximately 34,000 contiguous acres of land in the Cadiz and Fenner Valleys, and the Fenner Valley Mutual Water Company (FVMWC), a non-profit California mutual water company that would be formed to deliver water to its shareholders which are comprised of the Project Participants. The Cadiz Water Project would intercept groundwater which would otherwise flow to Bristol and Cadiz Dry Lakes, where it mixes with a highly saline groundwater zone and eventually evaporates; the Cadiz Water Project would extract this groundwater for beneficial uses, preventing up to two million acre-feet from mixing with the brine and evaporating over 50 years of pumping an annual average of 50,000 acre feet. (ESA 2011)

4. WATER SUPPLY PLANNING

SB 610 was passed in 2002 and amended the California Water Code by requiring a WSA to be completed for certain projects subject to CEQA, as discussed below in Sections 4.1 and 4.2. California Water Code, as amended by SB 610, requires that when a WSA is required it must address the following questions: Is there a public water system that will service the proposed project (Section 4.3); Is there a current UWMP that accounts for the project demand (Section 4.4); Is groundwater a component of the supplies for the project (Section 4.5); and are there sufficient supplies to serve the project over the next twenty years (Section 4.6). The primary question to be answered in a WSA is:

> *Will the total projected water supplies available during normal, single dry, and multiple dry water years during a 20-year projection meet the projected water demand of the proposed project, in addition to existing and planned future uses of the identified water supplies, including agricultural and manufacturing uses?*

The following sections address the SB 610 WSA questions as they relate to the proposed Desert Harvest Solar Project. Conclusions are provided in Section 5 of this WSA. Attachment A to this WSA provides a detailed discussion of the steps followed in preparation of this WSA to ensure compliance with SB 610 and California Water Code.

4.1 Is the proposed project subject to CEQA?

California Water Code Section 10910(a) states that any city or county that determines that a project, as defined in Section 10912, is subject to CEQA, which applies to projects requiring an issuance of a permit by a public agency, projects undertaken by a public agency, or projects funded by a public agency. The proposed DHSP requires issuance of permits by a public agency and is, therefore, subject to CEQA.

4.2 Is the proposed project a "project" under SB 610?

California Water Code Section 10912(a) states that any proposed action which meets the definition of "project" under SB 610 is required to prepare a WSA to demonstrate whether sufficient water supplies are available to meet requirements of the proposed project under normal and drought conditions. SB 610 defines a "project" as any one of six different development types with certain water use requirements, as specified in the Water Code revised by SB 610. Each identified development type and associated water requirements are addressed below. Any mixed-use project which incorporates one of the six development types described below is also defined as a "project" under SB 610.

Residential Development

A proposed residential development of more than 500 dwelling units is defined as a "project" under SB 610. The proposed DHSP is not a residential development.

Shopping Center or Business Establishment

A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space is defined as a "project" under SB 610. The proposed DHSP is not a shopping center or residential development.

Commercial Office Building

A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space is defined as a "project" under SB 610. The proposed DHSP is not a commercial office building.

Hotel or Motel

A proposed hotel or motel, or both, having more than 500 rooms is defined as a "project" under SB 610. The proposed DHSP is not a hotel or motel.

Industrial, Manufacturing, or Processing Plant or Industrial Park

A proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area is defined as a "project" under SB 610.

The proposed DHSP is not a manufacturing plant, processing plant, or industrial park. The language of SB 610 is not clear on whether renewable energy projects such as the proposed DHSP should be considered an "industrial plant." If the proposed DHSP is considered to be an industrial plant, it should also be considered a "project" under SB 610 because it would occupy more than 40 acres of land. However, the passing of SB 267 on October 11, 2011 clarified that renewable energy projects are subject to the requirements of SB 610 by amending California Water Law to revise the definition of "project" specified in SB 610. Under SB 267, wind and photovoltaic projects which consume less than 75 afy of water are not considered to be a "project" under SB 610; subsequently, a WSA would not be required for this type of project. SB 267 does not state that renewable energy projects which use more than 75 afy, such as the proposed DHSP, are subject to SB 610 and must prepare a WSA; rather, it clarifies that those renewable projects which use less than 75 afy are not subject to such requirements. Construction of the project would require 400.51 to 500.51 afy of water over the 24-month construction period, while operation of the project would require 26.02 to 39.02 afy. Due to the construction water requirements associated with the proposed project, it has been determined that the DHSP is considered a "project" per SB 610, as clarified by SB 267. Therefore, this WSA has been prepared to satisfy the requirements of SB 610.

4.3 Is there a public water system that will serve the proposed project?

United States Code Title 42 Section 300f(4) describes that the term "public water system" refers to a system for the provision to the public of water for human consumption through pipes or other constructed conveyances, if such system has at least fifteen service connections or regularly serves at least twenty five individuals (42 U.S.C. Sec. 300f(4)). The proposed DHSP would not be serviced by a public water system. As described in Section 2, water required during construction and operation of the project would be obtained from groundwater well(s) located on- and/or off-site, and would pump water from the CVGB.

4.4 Is there a current UWMP that accounts for the project demand?

There are a number of UWMPs in Riverside County, including the following: City of Riverside UWMP, Coachella Valley Water District UWMP, Desert Water Agency UWMP, Eastern Municipal Water District UWMP, Riverside Highland Water Company UWMP, and Western Municipal Water District UWMP. None of these UWMPs address the proposed DHSP site; there is not a current UWMP that accounts for the project's water demands.

4.5 Is groundwater a component of the supplies for the project?

Yes, water supply requirements for the proposed DHSP would be met using water pumped from the CVGB. During the 24-month construction period for the Project, approximately 400.51 to 500.51 afy of water would be used for fugitive dust control and concrete batching, for a total construction water demand of 801.02 to 1,001.02 acre-feet. Local groundwater would also be used to meet the project's operational water requirements of 26.02 to 39.02 afy for panel washing and use at the O&M building. As previously described, the project's water supply would be pumped from the CVGB.

4.6 Are there sufficient supplies to serve the project over the next twenty years?

In order to determine whether there are sufficient supplies to serve the project over the next twenty years, the data and discussions provided in this section assess project-related water demands and non-project water demands over a twenty-year future projection, including with consideration to average-year, single-dry year, and multiple-dry year (drought) conditions. As discussed under "Safe Yield and Water Budget," there is a wide variation in expert opinion as to what the current water budget of the CVGB is. In order to address this discrepancy and account for all potential impacts of the project, this WSA includes assessment of water supply availability under each of the potential water budget scenarios identified in Tables WSA-4 and WSA-5. A number of assumptions have been made to facilitate the water availability projections presented in this section. These assumptions are listed below.

- Estimates of recharge from precipitation during single-dry year and multiple-dry year conditions are discussed below under "Groundwater Supply Availability Projections" and presented in Tables WSA-12a through 12c, one table for each of the precipitation scenarios identified in Tables WSA-4 and WSA-5. As shown in each of the WSA-12 tables, it is assumed that a single-dry year would result in 25 percent less recharge from precipitation, while multiple-dry years would result in 15 percent, 30 percent, and 45 percent less recharge from precipitation over a three-year period; these estimates are highly subjective and were selected as a conservative reflection of potential drought conditions. Actual recharge from precipitation during drought years could be substantially more than shown in Tables WSA-12a through WSA-12c.

- Inflow to the CVGB from the Pinto Valley Groundwater Basin (estimated to be 3,173 afy) and the Orocopia Valley Groundwater Basin (estimated to be 1,700 afy) would remain constant over the 20-year projection and under varying climatic scenarios. Actual inflow from these basins may vary, depending upon groundwater usage in those basins, as well as conservation and management efforts.
- Inflow to the CVGB from the Cadiz Valley Groundwater Basin has not been quantified due to a lack of available data, although this basin has been identified by the DWR as being hydrologically connected to the CVGB (DWR 2004a) and may actually contribute inflow to the CVGB.
- Irrigation return flow to the CVGB would remain constant over the 20-year projection and under varying climatic scenarios. Actual return flow from irrigation may vary, depending upon agricultural practices and climatic variations.
- Wastewater return flow to the CVGB from the Chuckwalla and Ironwood State Prisons would reduce from approximately 800 afy under existing conditions to 600 afy over the lifetime of the project, accounting for a potential 35 percent reduction in prisoner populations. It is possible that the populations of Chuckwalla and Ironwood State Prisons would not reduce over the lifetime of the project, or may increase depending upon the needs of the State and the availability of other prison resources.
- Domestic and agricultural pumping would remain constant at 10,361 afy over the 20-year projection and under varying climatic scenarios. Most of the current groundwater pumping in the CVGB occurs in the western portion of the basin, near the town of Desert Center (BLM 2011a). The population of Desert Center decreased by nine percent between 2000 and 2011 (AmericanTowns 2011); it is not anticipated that the population of Desert Center would increase substantially over the 20-year projections such that domestic groundwater pumping would be affected. It is possible that actual domestic pumping rates could decrease, if the negative population trend of Desert Center continues.
- Evapotranspiration at Palen Dry Lake would remain constant at 350 afy over the 20-year projection and under varying climatic scenarios. The actual rate of groundwater discharge at Palen Dry Lake may vary depending on groundwater pumping and climatic conditions.
- Construction and operational water requirements for the proposed DHSP were assumed to be the maximum of the identified ranges. As such, 515 afy would be required during construction, and 39 afy would be required during operation of the project. Construction and operational water usage may be substantially less, particularly depending on climatic conditions; for instance, less water would be needed for construction-related dust suppression or for operational panel-washing during higher-precipitation years.
- All cumulative water uses described in Tables WSA-6 and WSA-7 would occur at the same time as the proposed DHSP. Not all of these uses have been approved or issued final environmental analyses, including the Eagle Creek Pumped Storage Project, which has a notable construction water requirement of 2,380 to 8,066 afy; however, in order to be conservative in water availability projections, all potential water uses are considered.
- All reasonably foreseeable projects identified in Tables WSA-6 and WSA-7 would meet their water supply requirements with groundwater pumped from the CVGB. It is possible that some

of these projects may obtain their required water supply from an alternative water source, such as imported water purchased from a local purveyor.

The water balance projections listed in Tables WSA-9 through WSA-15 would be directly affected if the assumptions summarized above are not met. However, these assumptions reflect the worst-case scenario and have therefore been applied to the water availability projections in order to be as conservative as possible for the purposes of this analysis.

Project and Non-Project Water Demands

Water demands of the proposed project and other projects which are anticipated to utilize the Chuckwalla Valley Groundwater Basin are described below, in order to characterize water supply availability.

Project Demands

During the project's 24-month (2-year) construction period, approximately 400.51 to 500.51 afy of water would be required, for a total construction water use of 801.02 to 1,001.02 acre-feet. Construction water would be used for dust suppression, concrete manufacturing, fire safety, and the implementation of mitigation measures. Following the completion of construction, the proposed project would require 26.02 to 39.02 afy for operations and maintenance activities, including panel-washing activities. As described above, in order to be conservative for the purposes of this WSA, it is assumed that the upper estimates of water supply requirements would occur under the proposed project, or 500.51 afy during construction and 39.02 afy during operation and maintenance. Table WSA-9 identifies the proposed project's annual water requirements over a 20-year projection.

Table WSA-9. Proposed DHSP – 20-year Water Use Projections

Year	1	2	3	4	5	6	7	8	9	10
Acre-feet[1]	500.51	500.51	39.02	39.02	39.02	39.02	39.02	39.02	39.02	39.02
5-year average	—	—	—	—	183.62	—	—	—	—	39.02
Total	500.51	1,001.02	1,040.04	1,079.06	1,118.08	1,157.10	1,196.12	1,235.14	1,274.16	1,313.18
Year	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Acre-feet	39.02	39.02	39.02	39.02	39.02	39.02	39.02	39.02	39.02	39.02
5-year average	—	—	—	—	39.02	—	—	—	—	39.02
Total	1,352	1,391.22	1,430.24	1,469.26	1,508.28	1,547.30	1,586.32	1,625.34	1,664.36	1,703.38

1 - As described above, the proposed DHSP would require approximately 400.51 to 500.51 afy of water during construction and 26.02 to 39.02 afy of water during operations; in order to be conservative for the purposes of this analysis, it is assumed that the upper estimates for construction and operational water requirements would occur.

Table WSA-9 indicates that the project's water demand would be greatest during the 24-month construction period, and that the highest water demand would occur during the first five years of the project. Over a 20-year projection, overall water use associated with the proposed DHSP would be approximately 1,703.38 acre-feet.

Non-Project Demands

A variety of existing and anticipated non-project water demands utilize the Chuckwalla Valley Groundwater Basin as a water supply source. As described above in Section 4.4, there is no current UWMP which accounts for water demand associated with use of the CVGB. In addition, the DWR does not identify any groundwater management efforts or public or private water agencies within the CVGB (DWR 2004a), which could provide information on other uses of CVGB groundwater. Projections of non-project water demands have been made using available data, as referenced throughout this section. Table WSA-4 (Estimated Budget for the Chuckwalla Valley Groundwater Basin) indicates that non-project extractions and outflow from the CVGB include ongoing pumping for agricultural and domestic purposes (10,361 afy), underflow to Palo Verde Mesa Groundwater Basin (400 afy), and evapotranspiration at Palen Dry Lake (350 afy). In addition, other reasonably foreseeable projects in the area are anticipated to use the CVGB as a water supply source. Tables WSA-10 and WSA-11 include water usage information for other projects in the CVGB.

Table WSA-10. Cumulative Projects – Water Use Summary

Project Name	Construction Duration (years)	Annual Construction Water Use (afy)	Annual Operational Water Use (afy)
Palen Solar Power Project	3	426	300
First Solar Desert Sunlight Solar Farm[1]	2.2	600 - 650	0.3
Red Bluff Substation	2.2	150	—
Gen-tie line	1	6.25	—
Devers-Palo Verde No. 2 Transmission Line Project	3	4	—
Colorado River Substation Expansion	2	66 - 215	—
Blythe Energy Project Transmission Line	2	4	—
Desert Southwest Transmission Line	2	0.6	—
Eagle Crest Pumped Storage Project	4	2,380 – 8,066	1,628
Genesis Solar Energy Project	3	616 – 1,368	1,644
Devers-Palo Verdi II Transmission	—	2	—
Blythe Energy Transmission Line	—	2	—
Desert SW Transmission	—	0.3	—

Source: BLM 2011a; BLM 2011b
1 - As described in Table WSA-4 (Estimated Budget for the Chuckwalla Valley Groundwater Basin), water use associated with the Desert Sunlight Solar Farm is accounted for in the current estimated budget for the CVGB; for the purpose of evaluating other known and anticipated uses in the CVGB, Desert Sunlight water requirements are considered a cumulative use, as indicated in Table WSA-6.

The following Table WSA-11 provides an extrapolation of the construction and operational water requirements indicated above over a future 20-year period. The water use totals provided in Table WSA-11 are used in calculating the water availability projections which are presented in Tables WSA-13a through WSA-19c.

Table WSA-11. Cumulative Projects – Water Use Projections (afy)

Cumulative Projects[1]	Const.	O&M	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019–2043
Western Chuckwalla Valley Groundwater Basin												
Palen Solar Power Project	436	300	0	426	426	436	300	300	300	300	300	300
First Solar Desert Sunlight[2]	600–650	0.3		0	[650][2]	[650][2]	0.3	0.3	0.3	0.3	0.3	0.3
Red Bluff Substation	300	0	0	0	150	150	0	0	0	0	0	
Gen-Tie Line	6.25	0	0	0	0	6.25	0	0	0	0	0	0
Devers-Palo Verde II Transmission	2		0	2	2	2	0	0	0	0	0	0
Colorado River Substation Expansion[3]	66–215		0	0	215	66	0	0	0	0	0	0
Blythe Energy Transmission Line	2		2	2	0	0	0	0	0	0	0	0
Desert Southwest Transmission Line	0.3		0	0	0	0.3	0.3	0	0	0	0	0
Eagle Crest Pumped Storage Startup	2,380–8,066	1,628	0	0	0	0	8,066	8,066	8,066	8,066	2,380	1,628
Total WESTERN SUB-BASIN DEMAND			*2*	*430*	*793*[2]	*660.55*[2]	*8, 366.6*	*8,366.3*	*8,366.3*	*8,366.3*	*2,680.3*	*1,928.3*
Eastern Chuckwalla Valley Groundwater Basin												
Genesis Solar Energy Project[4]	616 - 1,368	1,644	616	1,368	616	616	1,644	1,644	1,644	1,644	1,644	1,644
Devers-Palo Verde II Transmission	2		0	2	2	2	0	0	0	0	0	0
Blythe Energy Transmission Line	2		2	2	0	0	0	0	0	0	0	0
Desert SW Transmission	0.3		0	0	0	0.3	0.3	0	0	0	0	0
Total EASTERN SUB-BASIN DEMAND			*618*	*1,372*	*618*	*618.3*	*1,644.3*	*1,644*	*1,644*	*1,644*	*1,644*	*1,644*
Combined Western and Eastern Chuckwalla Valley Groundwater Basin												
TOTAL CVGB DEMAND			**620**	**1,802**	**1,411**[2]	**1,278.85**[2]	**10,010.9**	**10,010.3**	**10,010.3**	**10,010.3**	**4,324.3**	**3,572.3**

Notes for Table WSA-11

1 - Status of cumulative projects listed in this table:
- Gen-Tie Line construction would being in the 3rd or 4th quarter of 2012 and would last for an estimated 12 months; due to the late-2012 construction start, it is anticipated that most water use associated with the gen-tie line would occur in 2013.
- Palen Solar Energy Project was approved by the CEC in December of 2010, Final EIS published in May of 2011, proposed to be online in 2012
- First Solar Desert Sunlight was approved in August of 2011 and was under construction at the time of publication of the Notice of Intent for DHSP (September 15, 2011).
- Devers-Palo Verde II Transmission Line Project: BLM issued Record of Decision in July of 2011
- Colorado River Substation Expansion: Construction anticipated to initiate in December of 2011.
- Blythe Energy Transmission Line: Existing.
- Desert Southwest Transmission Line: Approved by BLM in 2006.
- Eagle Crest Pumped Storage: FERC Draft EIS published in December of 2010.
- Genesis Solar Energy Project: Currently under construction.

2 - The First Solar Desert Sunlight Project would require 650 afy of water for construction in 2012 and 2013; as discussed in Section 3.20, these construction water requirements were accounted for in the safe yield estimates provided in Table 3.20 2 (Estimated Budget for the Chuckwalla Valley Groundwater Basin), because construction of the Desert Sunlight Project was ongoing at the time of publication of the Notice of Intent for the proposed project and construction water use is therefore considered part of baseline conditions. This table shows the Desert Sunlight construction water usage, but does not include this quantity in the total water balance values, in order to avoid calculating for this amount twice – once in the safe yield estimate and once in the cumulative balance calculations. Operational water requirements of 0.3 afy for the Desert Sunlight Project are included in the totals because this amount was not previously accounted for in the safe yield estimates.

3 - The Colorado River Substation Expansion project would pump 300,000 gallons per day (gpd) over the first four to six months, or a total of 110.5 to 165.7 acre-feet, and 120,000 gpd over the following 18 months, or 198.9; in total, this project is anticipated to pump 309.3 to 364.6 acre-feet over 22 to 24 months, or an average annual rate of 215 afy during the first full year (2012) and 66 afy during the second year. No operational water use has been identified.

4 - The Genesis analysis noted that the Desert Sunlight Solar Farm project would pump 27 afy of groundwater during the construction period and 3.8 afy during the operational period; however, the Final EIS for Desert Sunlight indicates that this project would pump an average of 1,556 afy during construction and less than 0.3 afy during operation. For the purposes of this analysis, the quantities indicated in the Desert Sunlight Final EIS are used.

Source: CEC 2009; CEC 2010; CPUC 2011; WorleyParsons 2009

As noted above, the Eagle Crest Pumped Storage Project is anticipated to consume substantially more water than other uses of the CVGB, with construction water requirements ranging from 2,380 to 8,066 afy. The Draft EIS (Federal Energy Regulatory Commission) and EIR (State Water Resources Control Board) for the Eagle Crest Project were published in 2010, and the Final EIS was published in January of 2012. At the time of preparation of this WSA, no decision has been made on the Eagle Crest project; however, in order to be conservative in water supply availability projections, it is assumed that all projects identified in the cumulative scenario would be implemented at the same time as the proposed DHSP, including the Eagle Crest Pumped Storage Project. Although the Eagle Crest project would require a substantial water supply, some amount of groundwater is also anticipated to be returned to the CVGB through infiltration from reservoir systems proposed under this project. This infiltration, or seepage, is discussed below, under “Supply Reliability Considerations.”

Groundwater Supply Availability Projections

This section considers groundwater supply availability under varying climatic conditions, including normal-year, single-dry-year, and multiple-dry-year. As described in Section 3.1 (Basin Characteristics), there is variation in expert opinion regarding the quantity of recharge from precipitation to the CVGB under present conditions; Tables WSA-4 and WSA-5 present three different scenarios of precipitation recharge quantities, each of which is assessed here.

Table WSA-3 shows that in an average year, the Chuckwalla Valley area receives 3.6 inches of precipitation, while high- and low-precipitation months between 1913 and 2008 have been recorded at 5.92 inches and zero inches, respectively. This precipitation data was measured at Blythe Airport, and does not reflect precipitation across the watershed under single-dry year and multiple-dry year scenarios; therefore, assumptions have been made to reflect these conditions, as shown below in Tables WSA-12a through WSA-12c.

Table WSA-12a estimates recharge from precipitation assuming that under normal-year conditions, the CVGB receives 9,448 afy in recharge from precipitation, while Table WSA-12b assumes 2,060 afy, and Table WSA-12c assumes 6,125, where the first value is identified in the budget in Table WSA-4 and the second and third values are identified in the budget in Table WSA-5. The estimates provided in Tables WSA-12a through WSA-12c indicate that, for the purposes of this analysis, it is assumed that under single-dry year conditions, the CVGB would receive 25 percent less recharge from precipitation than under a normal water year, and that under multiple-dry year conditions, the CVGB would receive 15 percent, 30 percent, and 45 percent less recharge from precipitation during each of the three years comprising multiple-dry year conditions. It is important to note that these values are highly subjective and actual precipitation rates may vary greatly under varying climatic conditions.

Table WSA-12a (9,448 afy normal year). Recharge from Precipitation in Varying Climatic Scenarios

Climate Scenario		Recharge from Precipitation (afy)	Percent of Normal-Year
Normal Water Year		9,448	100%
Single-Dry Water Year		7,086	75%
Multiple-Dry Water Year:	Year 1	8,031	85%
	Year 2	6,614	70%
	Year 3	5,196	55%

Table WSA-12b (2,060 afy normal year). Recharge from Precipitation in Varying Climatic Scenarios

Climate Scenario		Recharge from Precipitation (afy)	Percent of Normal-Year
Normal Water Year		2,060	100%
Single-Dry Water Year		1,545	75%
Multiple-Dry Water Year:	Year 1	1,751	85%
	Year 2	1,442	70%
	Year 3	1,133	55%

Table WSA-12c (6,125 afy normal year). Recharge from Precipitation in Varying Climatic Scenarios

Climate Scenario		Recharge from Precipitation (afy)	Percent of Normal-Year
Normal Water Year		6.125	100%
Single-Dry Water Year		4,594	75%
Multiple-Dry Water Year:	Year 1	5,206	85%
	Year 2	4,288	70%
	Year 3	3,369	55%

The following tables provide water supply availability projections under each of the climatic scenarios described above, across a future projection of 20 years. In order to simplify this tabular presentation, supply availability projections are presented in five-year increments, with each scenario presented in a separate table.

As previously discussed, there is varied expert opinion regarding the water budget of the CVGB, and this WSA assesses several potential scenarios for the existing water budget, shown in Tables WSA-4 and WSA-5. Therefore, for each year of the water availability projections shown below, three tables are provided, one to represent the budget shown in Table WSA-4, one to represent the low end of the budget range shown in Table WSA-5, and one to represent the high end of the budget range shown in Table WSA-5; these tables are labeled “a”, “b”, and “c”, respectively. In addition, in order to portray the low and high ends of the range shown in Table WSA-5, the following tables assume that when normal-water-year conditions provide recharge from precipitation in the amount of 2,060 afy, recharge from underflow (from Pinto and Orocopia Valley Basins) would be 953 afy, and when normal-water-year conditions provide recharge from precipitation in the amount of 6,125 afy, recharge from underflow would be 1,906 afy; this approach is considered appropriate to characterize the range of values shown for the budget estimated in Table WSA-5.

Tables WSA-13a through WSA-13c show water availability projections for the year 2013, assuming recharge from precipitation of 9,448 afy, 2,060 afy, and 6,125 afy, respectively, and recharge from underflow of 3,500 afy, 953 afy, and 1,906 afy, respectively. The footnotes to Table WSA-13a describe calculation inputs; these inputs are the same for all subsequent projection tables and are therefore not repeated.

Table WSA-13a (9,449 afy normal year). Groundwater Availability Projections for Year 1 – 2013, in acre-feet per year*

Climate Scenario		Recharge from Precip	Available Supply	Flow to PVMGB	Palen Lake Evap	Existing Pumping	Cumulative Projects Pumping	DHSP Pumping	Total Demand	Balance
Normal Year		9,448	14,384	388	350	10,361	1,278.85	500.51	12,878.36	**1,505.64**
Single Dry Year		7,086	12,022	388	350	10,361	1,278.85	500.51	12,878.36	**–856.36**
Multi-Dry Year:	Year 1	8,031	12,967	388	350	10,361	1,278.85	500.51	12,878.36	**88.64**
	Year 2	6,614	11,745	388	350	10,361	1,278.85	500.51	12,878.36	**–1,133.36**
	Year 3	5,196	10,327	388	350	10,361	1,278.85	500.51	12,878.36	**–2,551.36**

* Each element of the groundwater availability projections presented in Tables WSA-9 through WSA-15 are described below.

- *Climate Scenario / Recharge from Precipitation.* The climate scenarios considered in this WSA are described in Table WSA-8 (Recharge to CVGB from Precipitation in Varying Climatic Scenarios) and associated text.
- *Available Supply.* Available supply is the total of all predicted inputs to the CVGB, including recharge from precipitation, underflow from Pinto Valley and Orocopia Valley Groundwater Basins, irrigation return flow, and wastewater return flow.
- *Existing Pumping.* Existing pumping is the ongoing rate of groundwater extraction noted in Table WSA-4 (Estimated Budget for the Chuckwalla Valley Groundwater Basin).
- *Cumulative Projects Pumping.* Cumulative projects pumping is the quantity of groundwater pumped by other reasonably foreseeable projects within the CVGB for this particular year; source data is shown in Table WSA-7 (Cumulative Projects – Water Use Projections) and in Table 4.20-5 (Estimated Cumulative Budget for the Chuckwalla Valley Groundwater Basin) presented in Section 4.20.15 of the EIS.
- *DHSP Pumping.* DHSP pumping is the quantity of water anticipated to be pumped for the proposed project in this particular year; source data is shown in Table WSA-5 (Proposed DHSP – Water Use Projections).
- *Flow to PVMGB.* Estimated outflow to the Palo Verde Mesa Groundwater Basin (PVMGB) via subsurface flow from the eastern portion of the CVGB varies per year depending upon pumping rates in the eastern portion of the CVGB; the proposed DHSP is located in the western portion of the CVGB and is not anticipated to have an appreciable effect on underflow rates from the eastern portion of the CVGB into the PVMGB. (WorleyParsons 2009)
- *Palen Lake Evapotranspiration.* Evapotranspiration is the amount of plant transpiration and evaporation of subsurface waters which occurs at Palen Dry Lake. (WorleyParsons 2009)
- *Total Demand.* Total demand is the sum of Existing Pumping, Cumulative Projects Pumping, DHSP Pumping, and Other Demands.
- *Balance.* The groundwater balance reflects the quantity of water remaining after Total Demand is subtracted from Available Supply; a negative balance reflects overdraft conditions.

Table WSA-13b (2,060 afy normal year). Groundwater Availability Projections for Year 1 – 2013, in acre-feet per year

Climate Scenario		Recharge from Precip	Available Supply	Flow to PVMGB	Palen Lake Evap	Existing Pumping	Cumulative Projects Pumping	DHSP Pumping	Total Demand	Balance
Normal Year		2,060	4,449	388	350	10,361	1,278.85	500.51	12,878.36	**–8,429.36**
Single Dry Year		1,545	3,934	388	350	10,361	1,278.85	500.51	12,878.36	**–8,944.36**
Multi-Dry Year:	Year 1	1,751	4,140	388	350	10,361	1,278.85	500.51	12,878.36	**–8,738.36**
	Year 2	1,442	3,831	388	350	10,361	1,278.85	500.51	12,878.36	**–9,047.36**
	Year 3	1,133	3,522	388	350	10,361	1,278.85	500.51	12,878.36	**–9,356.36**

Table WSA-13c (6,125 afy normal year). Groundwater Availability Projections for Year 1 – 2013, in acre-feet per year

Climate Scenario		Recharge from Precip	Available Supply	Flow to PVMGB	Palen Lake Evap	Existing Pumping	Cumulative Projects Pumping	DHSP Pumping	Total Demand	Balance
Normal Year		6,125	9,467	388	350	10,361	1,278.85	500.51	12,878.36	**–3,411.36**
Single Dry Year		4,594	7,936	388	350	10,361	1,278.85	500.51	12,878.36	**–4,942.61**
Multi-Dry Year:	Year 1	5,206	8,548	388	350	10,361	1,278.85	500.51	12,878.36	**–4,330.11**
	Year 2	4,288	7,630	388	350	10,361	1,278.85	500.51	12,878.36	**–5,248.86**
	Year 3	3,369	6,711	388	350	10,361	1,278.85	500.51	12,878.36	**–6,167.61**

Table WSA-14a (9,448 afy normal year). Groundwater Availability Projections for Years 4 and 5 – 2017 and 2018 in acre-feet per year*

Climate Scenario		Recharge from Precip	Available Supply	Flow to PVMGB	Palen Lake Evap	Existing Pumping	Cumulative Projects Pumping	DHSP Pumping	Total Demand	Balance
Year 4 – 2017 (Palen, Genesis, and Eagle Crest projects predicted to consume maximum construction water in 2017)										
Normal Year		9,448	14,384	334.5	350	10,361	10,010.30	39.02	21,094.82	**–6,710.82**
Single Dry Year		7,086	12,022	334.5	350	10,361	10,010.30	39.02	21,094.82	**–9,072.82**
Multi-Dry Year:	Year 1	8,031	12,967	334.5	350	10,361	10,010.30	39.02	21,094.82	**–8,127.82**
	Year 2	6,614	11,745	334.5	350	10,361	10,010.30	39.02	21,094.82	**–9,349.82**
	Year 3	5,196	10,327	334.5	350	10,361	10,010.30	39.02	21,094.82	**–10,767.82**
Year 5 – 2018 (Eagle Crest construction water uses predicted to reduce by 109 percent in 2018)										
Normal Year		9,448	14,384	322	350	10,361	4,324.30	39.02	15,396.32	**–1,012.32**
Single Dry Year		7,086	12,022	322	350	10,361	4,324.30	39.02	15,396.32	**–3,374.32**
Multi-Dry Year:	Year 1	8,031	12,967	322	350	10,361	4,324.30	39.02	15,396.32	**–2,429.32**
	Year 2	6,614	11,745	322	350	10,361	4,324.30	39.02	15,396.32	**–3,651.32**
	Year 3	5,196	10,327	322	350	10,361	4,324.30	39.02	15,396.32	**–5,069.32**

* Tables WSA-14a through WSA-14-c include projections for both years 2017 and 2018, years 4 and 5 of the project, because groundwater pumping associated with cumulative projects is substantially higher in 2017 than in other 5-year increment years. The estimates provided in the following tables are discussed below, after Table WSA-19.

Table WSA-14b (2,060 afy normal year). Groundwater Availability Projections for Years 4 and 5 – 2017 and 2018 in acre-feet per year

Climate Scenario		Recharge from Precip	Available Supply	Flow to PVMGB	Palen Lake Evap	Existing Pumping	Cumulative Projects Pumping	DHSP Pumping	Total Demand	Balance
Year 4 – 2017 (Palen, Genesis, and Eagle Crest projects predicted to consume maximum construction water in 2017)										
Normal Year		2,060	4,449	334.5	350	10,361	10,010.30	39.02	21,094.82	**–16,645.82**
Single Dry Year		1,545	3,934	334.5	350	10,361	10,010.30	39.02	21,094.82	**–17,160.82**
Multi-Dry Year:	Year 1	1,751	4,140	334.5	350	10,361	10,010.30	39.02	21,094.82	**–16,954.82**
	Year 2	1,442	3,831	334.5	350	10,361	10,010.30	39.02	21,094.82	**–17,263.82**
	Year 3	1,133	3,522	334.5	350	10,361	10,010.30	39.02	21,094.82	**–17,572.82**
Year 5 – 2018 (Eagle Crest construction water uses predicted to reduce by 109 percent in 2018)										
Normal Year		2,060	4,449	322	350	10,361	4,324.30	39.02	15,396.32	**–10,947.32**
Single Dry Year		1,545	3,934	322	350	10,361	4,324.30	39.02	15,396.32	**–11,462.32**
Multi-Dry Year:	Year 1	1,751	4,140	322	350	10,361	4,324.30	39.02	15,396.32	**–11,256.32**
	Year 2	1,442	3,831	322	350	10,361	4,324.30	39.02	15,396.32	**–11,565.32**
	Year 3	1,133	3,522	322	350	10,361	4,324.30	39.02	15,396.32	**–11,874.32**

Table WSA-14c (6,125 afy normal year). Groundwater Availability Projections for Years 4 and 5 – 2017 and 2018 in acre-feet per year

Climate Scenario		Recharge from Precip	Available Supply	Flow to PVMGB	Palen Lake Evap	Existing Pumping	Cumulative Projects Pumping	DHSP Pumping	Total Demand	Balance
Year 4 – 2017 (Palen, Genesis, and Eagle Crest projects predicted to consume maximum construction water in 2017)										
Normal Year		6,125	9,467	334.5	350	10,361	10,010.30	39.02	21,094.82	**–11,627.82**
Single Dry Year		4,594	7,936	334.5	350	10,361	10,010.30	39.02	21,094.82	**–13,159.07**
Multi-Dry Year:	Year 1	5,206	8,548	334.5	350	10,361	10,010.30	39.02	21,094.82	**–12,546.57**
	Year 2	4,288	7,630	334.5	350	10,361	10,010.30	39.02	21,094.82	**–13,465.32**
	Year 3	3,369	6,711	334.5	350	10,361	10,010.30	39.02	21,094.82	**–14,384.07**
Year 5 – 2018 (Eagle Crest construction water uses predicted to reduce by 109 percent in 2018)										
Normal Year		6,125	9,467	322	350	10,361	4,324.30	39.02	15,396.32	**–5,929.32**
Single Dry Year		4,594	7,936	322	350	10,361	4,324.30	39.02	15,396.32	**–7,460.57**
Multi-Dry Year:	Year 1	5,206	8,548	322	350	10,361	4,324.30	39.02	15,396.32	**–6,848.07**
	Year 2	4,288	7,630	322	350	10,361	4,324.30	39.02	15,396.32	**–7,766.82**
	Year 3	3,369	6,711	322	350	10,361	4,324.30	39.02	15,396.32	**–8,685.57**

Table WSA-15a (9,448 afy normal year). Groundwater Availability Projections for Year 10 – 2023 in acre-feet per year

Climate Scenario		Recharge from Precipitation	Available Supply	Flow to PVMGB	Palen Lake Evap	Existing Pumping	Cumulative Projects Pumping	DHSP Pumping	Total Demand	Balance
Normal Year		9,448	14,384	256.5	350	10,361	3,572.30	39	14,578.82	**–194.82**
Single Dry Year		7,086	12,022	256.5	350	10,361	3,572.30	39	14,578.82	**–2,556.82**
Multi-Dry Year:	Year 1	8,031	12,967	256.5	350	10,361	3,572.30	39	14,578.82	**–1,611.82**
	Year 2	6,614	11,745	256.5	350	10,361	3,572.30	39	14,578.82	**–2,833.82**
	Year 3	5,196	10,327	256.5	350	10,361	3,572.30	39	14,578.82	**–4,251.82**

Table WSA-15b (2,060 afy normal year). Groundwater Availability Projections for Year 10 – 2023 in acre-feet per year

Climate Scenario		Recharge from Precipitation	Available Supply	Flow to PVMGB	Palen Lake Evap	Existing Pumping	Cumulative Projects Pumping	DHSP Pumping	Total Demand	Balance
Normal Year		2,060	4,449	256.5	350	10,361	3,572.30	39	14,578.82	**–10,129.82**
Single Dry Year		1,545	3,934	256.5	350	10,361	3,572.30	39	14,578.82	**–10,644.82**
Multi-Dry Year:	Year 1	1,751	4,140	256.5	350	10,361	3,572.30	39	14,578.82	**–10,438.82**
	Year 2	1,442	3,831	256.5	350	10,361	3,572.30	39	14,578.82	**–10,747.82**
	Year 3	1,133	3,522	256.5	350	10,361	3,572.30	39	14,578.82	**–11,056.82**

Table WSA-15c (6,125 afy normal year). Groundwater Availability Projections for Year 10 – 2023 in acre-feet per year

Climate Scenario		Recharge from Precipitation	Available Supply	Flow to PVMGB	Palen Lake Evap	Existing Pumping	Cumulative Projects Pumping	DHSP Pumping	Total Demand	Balance
Normal Year		6,125	9,467	256.5	350	10,361	3,572.30	39	14,578.82	**–5,111.82**
Single Dry Year		4,594	7,936	256.5	350	10,361	3,572.30	39	14,578.82	**–6,643.07**
Multi-Dry Year:	Year 1	5,206	8,548	256.5	350	10,361	3,572.30	39	14,578.82	**–6,030.57**
	Year 2	4,288	7,630	256.5	350	10,361	3,572.30	39	14,578.82	**–6,949.32**
	Year 3	3,369	6,711	256.5	350	10,361	3,572.30	39	14,578.82	**–7,868.07**

Table WSA-16a (9,448 afy normal year). Groundwater Availability Projections for Year 15 – 2028 in acre-feet per year

Climate Scenario		Recharge from Precipitation	Available Supply	Flow to PVMGB	Palen Lake Evap	Existing Pumping	Cumulative Projects Pumping	DHSP Pumping	Total Demand	Balance
Normal Year		9,448	14,384	199.5	350	10,361	3,572.30	39	14,521.82	**–137.82**
Single Dry Year		7,086	12,022	199.5	350	10,361	3,572.30	39	14,521.82	**–2,499.82**
Multi-Dry Year:	Year 1	8,031	12,967	199.5	350	10,361	3,572.30	39	14,521.82	**–1,554.82**
	Year 2	6,614	11,745	199.5	350	10,361	3,572.30	39	14,521.82	**–2,776.82**
	Year 3	5,196	10,327	199.5	350	10,361	3,572.30	39	14,521.82	**–4,194.82**

Table WSA-16b (2,060 afy normal year). Groundwater Availability Projections for Year 15 – 2028 in acre-feet per year

Climate Scenario		Recharge from Precipitation	Available Supply	Flow to PVMGB	Palen Lake Evap	Existing Pumping	Cumulative Projects Pumping	DHSP Pumping	Total Demand	Balance
Normal Year		2,060	4,449	199.5	350	10,361	3,572.30	39	14,521.82	**–10,072.82**
Single Dry Year		1,545	3,934	199.5	350	10,361	3,572.30	39	14,521.82	**–10,587.82**
Multi-Dry Year:	Year 1	1,751	4,140	199.5	350	10,361	3,572.30	39	14,521.82	**–10,381.82**
	Year 2	1,442	3,831	199.5	350	10,361	3,572.30	39	14,521.82	**–10,690.82**
	Year 3	1,133	3,522	199.5	350	10,361	3,572.30	39	14,521.82	**–10,999.82**

Table WSA-16c (6,125 afy normal year). Groundwater Availability Projections for Year 15 – 2028 in acre-feet per year

Climate Scenario		Recharge from Precipitation	Available Supply	Flow to PVMGB	Palen Lake Evap	Existing Pumping	Cumulative Projects Pumping	DHSP Pumping	Total Demand	Balance
Normal Year		6,125	9,467	199.5	350	10,361	3,572.30	39	14,521.82	**–5,054.82**
Single Dry Year		4,594	7,936	199.5	350	10,361	3,572.30	39	14,521.82	**–6,586.07**
Multi-Dry Year:	Year 1	5,206	8,548	199.5	350	10,361	3,572.30	39	14,521.82	**–5,973.57**
	Year 2	4,288	7,630	199.5	350	10,361	3,572.30	39	14,521.82	**–6,892.32**
	Year 3	3,369	6,711	199.5	350	10,361	3,572.30	39	14,521.82	**–7,811.07**

Table WSA-17a (9,448 afy normal year). Groundwater Availability Projections for Year 20 – 2033 in acre-feet per year

Climate Scenario	Recharge from Precipitation	Available Supply	Flow to PVMGB	Palen Lake Evap	Existing Pumping	Cumulative Projects Pumping	DHSP Pumping	Total Demand	Balance
Normal Year	9,448	14,384	150	350	10,361	3,572.30	39	14,472.32	**–88.32**
Single Dry Year	7,086	12,022	150	350	10,361	3,572.30	39	14,472.32	**–2,450.32**
Multi-Dry Year: Year 1	8,031	12,967	150	350	10,361	3,572.30	39	14,472.32	**–1,505.32**
Year 2	6,614	11,745	150	350	10,361	3,572.30	39	14,472.32	**–2,727.32**
Year 3	5,196	10,327	150	350	10,361	3,572.30	39	14,472.32	**–4,145.32**

Table WSA-17b (2,060 afy normal year). Groundwater Availability Projections for Year 20 – 2033 in acre-feet per year

Climate Scenario	Recharge from Precipitation	Available Supply	Flow to PVMGB	Palen Lake Evap	Existing Pumping	Cumulative Projects Pumping	DHSP Pumping	Total Demand	Balance
Normal Year	2,060	4,449	150	350	10,361	3,572.30	39	14,472.32	**–10,023.32**
Single Dry Year	1,545	3,934	150	350	10,361	3,572.30	39	14,472.32	**–10,538.32**
Multi-Dry Year: Year 1	1,751	4,140	150	350	10,361	3,572.30	39	14,472.32	**–10,332.32**
Year 2	1,442	3,831	150	350	10,361	3,572.30	39	14,472.32	**–10,641.32**
Year 3	1,133	3,522	150	350	10,361	3,572.30	39	14,472.32	**–10,950.32**

Table WSA-17c (6,125 afy normal year). Groundwater Availability Projections for Year 20 – 2033 in acre-feet per year

Climate Scenario	Recharge from Precipitation	Available Supply	Flow to PVMGB	Palen Lake Evap	Existing Pumping	Cumulative Projects Pumping	DHSP Pumping	Total Demand	Balance
Normal Year	6,125	9,467	150	350	10,361	3,572.30	39	14,472.32	**–5,005.32**
Single Dry Year	4,594	7,936	150	350	10,361	3,572.30	39	14,472.32	**–6,536.57**
Multi-Dry Year: Year 1	5,206	8,548	150	350	10,361	3,572.30	39	14,472.32	**–5,924.07**
Year 2	4,288	7,630	150	350	10,361	3,572.30	39	14,472.32	**–6,842.82**
Year 3	3,369	6,711	150	350	10,361	3,572.30	39	14,472.32	**–7,761.57**

Table WSA-18a (9,448 afy normal year). Groundwater Availability Projections for Year 1 – 2038 in acre-feet per year										
Climate Scenario		Recharge from Precipitation	Available Supply	Flow to PVMGB	Palen Lake Evap	Existing Pumping	Cumulative Projects Pumping	DHSP Pumping	Total Demand	Balance
Normal Year		9,448	14,384	106	350	10,361	3,572.30	39.02	14,428.32	**–44.32**
Single Dry Year		7,086	12,022	106	350	10,361	3,572.30	39.02	14,428.32	**–2,406.32**
Multi-Dry Year:	Year 1	8,031	12,967	106	350	10,361	3,572.30	39.02	14,428.32	**–1,461.32**
	Year 2	6,614	11,745	106	350	10,361	3,572.30	39.02	14,428.32	**–2,683.32**
	Year 3	5,196	10,327	106	350	10,361	3,572.30	39.02	14,428.32	**–4,101.32**

Table WSA-18b (2,060 afy normal year). Groundwater Availability Projections for Year 1 – 2038 in acre-feet per year										
Climate Scenario		Recharge from Precipitation	Available Supply	Flow to PVMGB	Palen Lake Evap	Existing Pumping	Cumulative Projects Pumping	DHSP Pumping	Total Demand	Balance
Normal Year		2,060	4,449	106	350	10,361	3,572.30	39.02	14,428.32	**–9,979.32**
Single Dry Year		1,545	3,934	106	350	10,361	3,572.30	39.02	14,428.32	**–10,494.32**
Multi-Dry Year:	Year 1	1,751	4,140	106	350	10,361	3,572.30	39.02	14,428.32	**–10,288.32**
	Year 2	1,442	3,831	106	350	10,361	3,572.30	39.02	14,428.32	**–10,597.32**
	Year 3	1,133	3,522	106	350	10,361	3,572.30	39.02	14,428.32	**–10,906.32**

Table WSA-18c (6,125 afy normal year). Groundwater Availability Projections for Year 1 – 2038 in acre-feet per year										
Climate Scenario		Recharge from Precipitation	Available Supply	Flow to PVMGB	Palen Lake Evap	Existing Pumping	Cumulative Projects Pumping	DHSP Pumping	Total Demand	Balance
Normal Year		6,125	9,467	106	350	10,361	3,572.30	39.02	14,428.32	**–4,961.32**
Single Dry Year		4,594	7,936	106	350	10,361	3,572.30	39.02	14,428.32	**–6,492.57**
Multi-Dry Year:	Year 1	5,206	8,548	106	350	10,361	3,572.30	39.02	14,428.32	**–5,880.07**
	Year 2	4,288	7,630	106	350	10,361	3,572.30	39.02	14,428.32	**–6,798.82**
	Year 3	3,369	6,711	106	350	10,361	3,572.30	39.02	14,428.32	**–7,717.57**

Table WSA-19a (9,448 afy normal year). Groundwater Availability Projections for Year 1 – 2043 in acre-feet per year										
Climate Scenario		**Recharge from Precipitation**	**Available Supply**	**Flow to PVMGB**	**Palen Lake Evap**	**Existing Pumping**	**Cumulative Projects Pumping**	**DHSP Pumping**	**Total Demand**	**Balance**
Normal Year		9,448	14,384	71	350	10,361	3,572.30	39.02	14,393.32	**–9.32**
Single Dry Year		7,086	12,022	71	350	10,361	3,572.30	39.02	14,393.32	**–2,371.32**
Multi-Dry Year:	Year 1	8,031	12,967	71	350	10,361	3,572.30	39.02	14,393.32	**–1,426.32**
	Year 2	6,614	11,745	71	350	10,361	3,572.30	39.02	14,393.32	**–2,648.32**
	Year 3	5,196	10,327	71	350	10,361	3,572.30	39.02	14,393.32	**–4,066.32**

Table WSA-19b (2,060 afy normal year). Groundwater Availability Projections for Year 1 – 2043 in acre-feet per year										
Climate Scenario		**Recharge from Precipitation**	**Available Supply**	**Flow to PVMGB**	**Palen Lake Evap**	**Existing Pumping**	**Cumulative Projects Pumping**	**DHSP Pumping**	**Total Demand**	**Balance**
Normal Year		2,060	4,449	71	350	10,361	3,572.30	39.02	14,393.32	**–9,944.32**
Single Dry Year		1,545	3,934	71	350	10,361	3,572.30	39.02	14,393.32	**–10,459.32**
Multi-Dry Year:	Year 1	1,751	4,140	71	350	10,361	3,572.30	39.02	14,393.32	**-10,253.32**
	Year 2	1,442	3,831	71	350	10,361	3,572.30	39.02	14,393.32	**-10,562.32**
	Year 3	1,133	3,522	71	350	10,361	3,572.30	39.02	14,393.32	**-10,871.32**

Table WSA-19c (6.125 afy normal year). Groundwater Availability Projections for Year 1 – 2043 in acre-feet per year										
Climate Scenario		**Recharge from Precipitation**	**Available Supply**	**Flow to PVMGB**	**Palen Lake Evap**	**Existing Pumping**	**Cumulative Projects Pumping**	**DHSP Pumping**	**Total Demand**	**Balance**
Normal Year		6,125	9,467	71	350	10,361	3,572.30	39.02	14,393.32	**-4,926.32**
Single Dry Year		4,594	7,936	71	350	10,361	3,572.30	39.02	14,393.32	**-6,457.57**
Multi-Dry Year:	Year 1	5,206	8,548	71	350	10,361	3,572.30	39.02	14,393.32	**-5,845.07**
	Year 2	4,288	7,630	71	350	10,361	3,572.30	39.02	14,393.32	**-6,763.82**
	Year 3	3,369	6,711	71	350	10,361	3,572.30	39.02	14,393.32	**-7,682.57**

It is important to note the assumptions used in calculating the projections shown above. For instance, the estimates shown in Tables WSA-12 through WSA-19 assume that all of the cumulative projects shown in Tables WSA-10 and WSA-11 would be under construction in the years noted. Some projects are anticipated to consume more water than others, and if not all projects are constructed per the schedules shown in Table WSA-11, the CVGB water balance could be substantially affected. For instance, the Eagle Crest Pumped Storage Project is noted as requiring 8,066 afy in years 2014 through 2017. If the Eagle Crest Pumped Storage Project is not constructed and the associated water requirement is not implemented, the water balance of the CVGB shown above in Table WSA-14a would only be negative during drought years in 2017. Following is a summary of the tables shown above.

- Table WSA-13a indicates that under the water budget shown in Table WSA-4 (9,448 afy normal-water-year recharge from precipitation), the CVGB would have a positive balance of 1,505.64 acre-feet during the first year of the project under normal water-year conditions, and a positive balance of 88.64 acre-feet during the first drought year in a multiple-dry-year scenario, while the balance would be negative under other dry-year scenarios, ranging from a projected deficit of 856.36 to 2,551.36 acre-feet. Tables WSA-13b and WSA-13c indicate that under the water budget shown in Table WSA-5 (2,060 – 6,125 afy normal-water-year recharge from precipitation), the CVGB would have a negative water balance of between 3,411.36 and 9,356.36 afy, depending on climatic conditions and actual recharge from precipitation and underflow; in other words, the CVGB would be overdrafted under all scenarios shown in Tables WSA-13c and WSA-13c. This is the anticipated result, as the budget shown in Table WSA-5, upon which these projections are based, is also a negative balance.
- Table WSA-14a indicates that based on the budget in Table WSA-4, the CVGB would have an estimated negative balance ranging from 6,710.82 to 10,767.82 acre-feet in 2017 and an estimated negative balance ranging from 1,012.32 to 5,069.32 acre-feet in 2018, depending on climatic conditions. Tables WSA-14b and WSA-14c also indicate increasing severity of overdraft conditions, ranging from a low of 5,929.32 acre-feet in 2018 with 6,125 afy recharge from precipitation, to a high of 17,572.82 afy in 2017, in the third of three consecutive drought years, and with 1,133 acre-feet recharge from precipitation.
- Table WSA-15a indicates that based on the budget in Table WSA-4, the CVGB would have an estimated negative balance ranging from 194.82 to 4,251.82 acre-feet in 2023, depending on climatic conditions. The deficits noted in Table WSA-15a are substantially less than the deficits noted in Tables WSA-13a and WSA-13b for the first, fourth, and fifth years of this analysis, indicating that overdraft conditions are temporary and respond directly to changes in the rates of groundwater pumping. Tables WSA-15b and WSA-15c continue to show substantial overdraft conditions of more than 10,000 acre-feet for the 2,060 afy recharge from precipitation (normal-year) conditions, and overdraft ranging between 5,111.82 and 7,868.82 afy for the 6.125 afy recharge from precipitation (normal-year) conditions. As with the projections shown in Table WSA-15a, although these estimates project overdraft in the CVGB, the severity of overdraft is decreasing.
- Table WSA-16a indicates that based on the budget in Table WSA-4, the CVGB would have an estimated negative balance ranging from 137.82 to 4,194.82 acre-feet in 2028, depending on climatic conditions. Tables WSA-16b and WSA-16c indicated that based on the budget in Table WSA-5, the CVGB would have an estimated negative balance ranging from 5,054.82 acre-feet in 2028, assuming normal-water-year recharge from precipitation in the amount of

6,125 acre-feet, and 10,999.82 acre-feet during the third consecutive drought year, with 1,133 acre-feet of recharge from precipitation. Again, the deficits noted in the Table WSA-16 series are substantially less than the deficits noted in preceding projections, indicating that overdraft conditions are temporary and respond to changes in the rates of groundwater pumping.

- Table WSA-17a indicates that the CVGB would have an estimated negative balance ranging from 88.32 to 4,145.32 acre-feet in 2033, assuming 9,448 afy recharge from precipitation under normal-water-year conditions, and depending on climatic conditions. Tables WSA-17b and WSA-17c continue to show substantial overdraft, ranging from 5,005.32 acre-feet assuming normal-water year conditions and 6,125 acre-feet recharge from precipitation, and 10,950.32 acre-feet during the third consecutive drought year and assuming 1,133 acre-feet recharge from precipitation. Consistent with the estimates and discussion provided for previous tables, the deficits noted in the Table WSA-17 series continue to indicate that overdraft conditions are temporary, and that overdraft conditions projected to occur during implementation of the project would recover over time.

As described in Section 1 of this WSA, SB 610 requires than a WSA examine water supply availability over a 20-year projection. The 20-year projections of the proposed project's use of CVGB water is provided in Tables WSA-13 through WSA-17, above. In addition, this WSA includes another 10 years of projections, in order to account for the proposed project's anticipated 30-year lifespan. These projections, presented in Tables WSA-18 and WSA-19, are summarized below.

- Table WSA-18a indicates that during the twenty-fifth year of water availability projections, and assuming normal-water-year recharge from precipitation in the amount of 9,448 acre-feet, the CVGB would continue to recover from projected overdraft conditions, with an estimated negative balance ranging from 44.32 to 4,101.32 acre-feet in 2038, depending on climatic conditions. Tables WSA-18b and WSA-18c indicate that projected overdraft conditions range from 4,961.32 acre-feet assuming 6,125 acre-feet of recharge from precipitation, to 10,906.32 acre-feet during the third consecutive drought year, assuming 1,133 acre-feet of recharge from precipitation. As with the preceding tables, although these projections indicate overdraft conditions, the severity of overdraft continues to decrease with time, and depending on climatic conditions.
- Table WSA-19a indicates that during the thirtieth year of water availability projections, and assuming 9,448 acre-feet of recharge from precipitation, as shown in Table WSA-4, the CVGB would continue to recover from projected overdraft conditions, with an estimated negative balance ranging from 9.32 to 4,066.32 acre-feet in 2043, depending on climatic conditions. Tables WSA-19b and WSA-19c also continue to show projected overdraft conditions with decreasing severity, ranging from 4,926.32 assuming 6,125 acre-feet of recharge from precipitation, to 10,871.32 acre-feet during the third consecutive drought year, assuming 1,133 acre-feet of recharge from precipitation.

A comparison of the groundwater availability projections presented above in Tables WSA-13a through WSA-19c is provided below, in Tables WSA-20a through WSA-20c.

Table WSA-20a (9,448 afy normal year). Comparison of Groundwater Availability Projections						
				Multi-Year Drought		
Year	Project Year	Normal Water Year	Single Drought Year	Year 1	Year 2	Year 3
2013	1	**1,505.64**	–856.36	**88.64**	–1,133.36	–2,551.36
2017	4	–6,710.82	–9,072.82	–8,127.82	–9,349.82	–10,767.82
2018	5	–1,012.32	–3,374.32	–2,429.32	–3,651.32	–5,069.32
2023	10	–194.82	–2,556.82	–1,611.82	–2,833.82	–4,251.82
2028	15	–137.82	–2,499.82	–1,554.82	–2,776.82	–4,194.82
2033	20	–88.32	–2,450.32	–1,505.32	–2,727.32	–4,145.32
2038	25	–44.32	–2,406.32	–1,461.32	–2,683.32	–4,101.32
2043	30	–9.32	–2,371.32	–1,426.32	–2,648.32	–4,066.32

Table WSA-20b (2,060 afy normal year). Comparison of Groundwater Availability Projections						
				Multi-Year Drought		
Year	Project Year	Normal Water Year	Single Drought Year	Year 1	Year 2	Year 3
2013	1	–8,429.36	–8,944.36	–8,738.36	–9,047.36	–9,356.36
2017	4	–16,645.82	–17,160.82	–16,954.82	17,263.82	–17,572.82
2018	5	–10,947.32	–11,462.32	–11,256.32	–11,565.32	–11,874.32
2023	10	–10,129.82	–10,644.82	–10,438.82	–10,747.82	–11,056.82
2028	15	–10,072.82	–10,587.82	–10,381.82	–10,690.82	–10,999.82
2033	20	–10,023.32	–10,538.32	–10,332.32	–10,641.32	–10,950.32
2038	25	–9,979.32	–10,494.32	–10,288.32	–10,597.32	–10,906.32
2043	30	–9,944.32	–10,459.32	–10,253.32	–10,562.32	–10,871.32

Table WSA-20a (6,125 afy normal year). Comparison of Groundwater Availability Projections						
				Multi-Year Drought		
Year	Project Year	Normal Water Year	Single Drought Year	Year 1	Year 2	Year 3
2013	1	–3,411.36	–4,942.61	–4,330.11	–5,248.86	–6,167.61
2017	4	–11,627.82	–13,159.07	–12,546.57	–13,465.32	–14,384.07
2018	5	–5,929.32	–7,460.57	–6,848.07	–7,766.82	–8,685.57
2023	10	–5,111.82	–6,643.07	–6,030.57	–6,949.32	–7,868.07
2028	15	–5,054.82	–6,586.07	–5,973.57	–6,892.32	–7,811.07
2033	20	–5,005.32	–6,536.57	–5,924.07	–6,842.82	–7,761.57
2038	25	–4,961.32	–6,492.57	–5,880.07	–6,798.82	–7,717.57
2043	30	–4,926.32	–6,457.57	–5,845.07	–6,763.82	–7,682.57

It is important to consider that the estimates of groundwater balance and overdraft provided in the preceding tables assumes worst-case conditions, in terms of the quantity of water that will be required for the proposed project and for cumulative projects. Further interpretation of the water availability projections presented above in Tables WSA-13a through WSA-19c and summarized in Tables WSA-20a through WSA-20c is provided below, in Section 5 (Conclusions).

Supply Reliability Considerations

As described at the beginning of this section, a number of assumptions and estimates were applied in order to generate the groundwater supply availability projections shown in Tables WSA-13a through WSA-19c. Assumptions listed at the beginning of Section 4.6 include the assumption that all reasonably foreseeable projects identified in Tables WSA-10 and WSA-11 would meet their water supply requirements with groundwater pumped from the CVGB. In actuality, other projects' water supply requirements may be met using alternative source(s). For instance, water for the Eagle Crest Pumped Storage Project may be pumped from the CVGB, and/or it may be contracted under a water transfer agreement from MWD's canal system (ECE 2008). The use of MWD-contracted water instead of CVGB water under this and/or other projects in the cumulative scenario could have a substantial effect on the water availability projections presented above, and could avoid the estimated drought-year groundwater deficits.

The projections shown in Tables WSA-13a through WSA-19c also do not account for groundwater management policies and proposed programs such as described in Section 3.3 (Groundwater Management), which are anticipated to positively influence supply availability. Such policies and programs include conjunctive use programs and groundwater seepage from the Eagle Crest Pumped Storage Project. These and other factors which would positively affect supply availability in the CVGB are summarized below, in Table WSA-21.

Table WSA-21. Water Supply Reliability Considerations

Supply Reliability Factors	Description	Effect on Water Supply
Riverside County General Plan	Policies OS 4.1 through OS 4.6 encourage supply reliability efforts including but not limited to coordination with agencies to implement groundwater banking and conjunctive use programs, develop aquifer recharge programs, preserve drainage and recharge areas.	n/a
Chuckwalla Groundwater Storage Program	This is a conjunctive use program under consideration by MWD that would recharge the CVGB with Colorado River water for storage in years when water is available then extract and deliver this water to demand areas when needed (CRBC 2000).	Up to an additional 150,000 afy would be stored in the CVGB.
Cadiz Valley Water Conservation, Recovery, and Storage Project	Similar to the Chuckwalla program, this is also a proposed conjunctive use project that would be implemented by the Santa Margarita Water District in partnership with Project Participants, Cadiz Inc., and the Fenner Valley Mutual Water Company. The Cadiz Groundwater Basin may be hydrologically connected to the CVGB, and this project could increase supply available to Project Participants within the CVGB.	Up to an additional 50,000 afy of groundwater that would otherwise evaporate at existing dry lakes would be produced from the Cadiz basin; Project Participants would have the opportunity to increase water supply available and water supply reliability over the project's 50-year life.
Eagle Crest Pumped Storage Project	This proposed project is a hydroelectric pumped storage project that would use off-peak energy to pump water from a lower reservoir to an upper reservoir. Surface water is currently not stored at the project site; the introduction of surface water in the proposed reservoirs would also recharge the CVGB through infiltration.	600 afy would infiltrate from the pumped storage project's reservoirs to the underlying CVGB (ECE 2008).

Table WSA-21. Water Supply Reliability Considerations

Supply Reliability Factors	Description	Effect on Water Supply
BLM Long-Range Study of the Chuckwalla Valley Groundwater Basin	In response to concerns that the CVGB is affected by long-term overdraft conditions, the BLM, in conjunction with Lawrence Berkeley National Laboratory and Pennsylvania State University, the USGS, and the NRCS, has initiated a four-pronged research agenda to assess and help address the impacts of solar energy development on the desert aquifers of southern California; this research is inclusive of the following: 1) consolidating existing groundwater monitoring programs to develop a basin network for hydrology study, 2) the creation of a centralized database, 3) the development of a numeric groundwater model for this basin, and 4) the development of a tool with broad applicability for land management decisions related to solar energy development (Godfrey et al. 2012). This effort will benefit groundwater supply reliability through understanding of the basin characteristics, and clarification of present uncertainties, such as the quantity of recharge from precipitation and underflow.	n/a

In addition to the above, the EIS/EIR for the proposed DHSP identifies several mitigation measures that would avoid adverse impacts to water supply under the proposed project, and ensure water supply reliability during project implementation. These measures are discussed below in Table WSA-22.

Table WSA-22. DHSP Mitigation Measures that Address Water Supply Reliability

Mitigation Number and Title	Summary	Effect(s) on Water Supply Reliability
WAT-2: Alternative Water Source and Groundwater Offsets	This measure requires that the project would not produce groundwater from the CVGB during any year it is projected that overdraft conditions would be present in the basin, with the exception that if CVGB water is consumed during overdraft year(s) it will be “replaced” through the implementation of water offsets within the basin. This measure also specifies that an out-of-basin water source(s) may be used to avoid the consumption of CVGB water.	The project would not perpetuate existing or projected overdraft conditions, if present. Through use of alternative water source(s) and implementation of groundwater offsets during overdraft years, the project would avoid contributions to cumulative overdraft conditions in the Chuckwalla Valley Groundwater Basin.
WAT-3: Groundwater Drawdown Monitoring and Reporting Plan	This measure specifies detailed groundwater monitoring, reporting, and coordination with agencies to occur during construction and operation of the project, and requires that project-related pumping would be reduced or ceased if local drawdown of more than 5 feet is detected.	Groundwater monitoring and reporting would ensure that if overdraft and/or drawdown effects occur during project-related pumping, actions would be taken to reduce associated adverse effects.
WAT-6: Drought Water Management and Water Conservation Education Programs	This measure requires the analysis of “severe” drought years per NOAA Palmer Drought Severity methods, and implementation of water conservation and education programs to address such conditions.	Project-related water use would be reduced as much as feasible during drought years.
WAT-7: Colorado River Water Supply Plan	This measure requires groundwater monitoring to determine if the project pumps any water from below the Colorado River accounting surface; if pumping draws water from below 234 feet below ground surface, water conservation measures would be implemented to “replace” the full quantity of such water.	Water conservation measures would be implemented to “replace” any Colorado River water pumped from the CVGB.

The water supply reliability considerations summarized in Table WSA-21 and the DHSP-specific mitigation measures discussed in Table WSA-22 would positively affect groundwater availability in the CVGB, and avoid adverse impacts to groundwater supply during implementation of the proposed DHSP.

5. CONCLUSIONS

It is anticipated that the CVGB would be affected by overdraft conditions during implementation of the proposed DHSP. Such conditions would occur regardless of the proposed project, as the project's maximum operational pumping requirement is approximately 39.02 afy, while the negative groundwater budget projections identified in Tables WSA-13a through WSA-19c are substantially greater than 39.02 acre-feet. Tables WSA-13a through WSA-19c show that projected groundwater deficits would decrease over time, including under single-year and multiple-year drought conditions. This indicates that overdraft conditions would be temporary, and that the CVGB would eventually recover from the projected negative water balance years, including under all cumulative water uses identified in Tables WSA-10 and WSA-11.

Groundwater management efforts described in Section 3.3 and in Table WSA-21 would contribute to additional supply in the CVGB, and could avoid the projected groundwater deficits noted in Tables WSA-13a through WSA-19c. Mitigation measures and/or alternative water sources associated with other reasonably foreseeable projects in the area would also have the potential to avoid the projected groundwater deficits during drought years. Mitigation measures included under the proposed DHSP ensure that the proposed project would not contribute to overdraft conditions in the CVGB, and that the project would not result in adverse impacts associated with groundwater supply or water supply reliability.

In conclusion, sufficient water is available for the proposed DHSP under normal-year, single-dry year, and multiple-dry year conditions due to the following:

1) Projected overdraft conditions in the CVGB are temporary, and recover with time;
2) Groundwater supply management in the CVGB contributes to supply reliability; and
3) Project-specific mitigation measures ensure that the proposed DHSP would not contribute to overdraft conditions in the CVGB (Mitigation Measure WAT-2: Alternative Water Source and Groundwater Offsets).

This WSA has been prepared in compliance with California Water Code, as amended by SB 610. Attachment A provides a detailed description of the steps followed to prepare this WSA.

6. REFERENCES

AECOM. 2011. Desert Sunlight Solar Farm Project: Response to Public Comments Regarding Potential Relationship Between Groundwater Pumping Levels and Impacts to the Colorado River. Appendix O – Accounting Surface Technical Memorandum. Prepared for Bureau of Land Management, Palm Springs–South Coast Field Office. January 5. [online]: http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/palmsprings/desert_sunlight.Par.92719.File.dat/Desert%20Sunlight%20FEIS%20appendix%20N-O.pdf. Accessed July 25, 2012.

AmericanTowns. 2011. Zip Code 92239 Population Overview. [online]: http://www.americantowns.com/ca/desertcenter/info/population/92239. Accessed November 8, 2011.

BLM (Bureau of Land Management). 2011a. Plan Amendment / Final EIS for the Palen Solar Power Project, Volume 1 of 2. Chapter 3: Affected Environment. May. [online]: http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/palmsprings/Palen_Solar_Power_Project.Par.76983.File.dat/Vol1_Palen%20PA-FEIS_ch3.pdf. Accessed November 4, 2011.

_____. 2011b. Desert Sunlight Solar Farm Project, California Desert Conservation Area Plan Amendment and Final Environmental Impact Statement. Volume II: Chapters 4 through 8. April.

_____. 2010. Plan Amendment / Final EIS for the Genesis Solar Energy Project, Volume 1 of 3. August. [online]: http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/palmsprings/genesis.Par.93917.File.dat/Vol1_Genesis%20PA-FEIS_0cover-ch1-ch2-Intro-PropAction.pdf. Accessed November 9, 2011.

_____. 2001. California Water Rights Fact Sheet. August 15. [online]: http://www.blm.gov/nstc/WaterLaws/pdf/California.pdf. Accessed November 9, 2011.

Buddemeier, R. W. & Schloss, J. A. 2000. Groundwater Storage and Flow. November 21. [online]: http://www.kgs.ku.edu/HighPlains/atlas/apgengw.htm. Accessed November 9, 2011.

CEC (California Energy Commission). 2009. Application for Certification for the Genesis Solar Energy Project. November 30. [online]: http://www.energy.ca.gov/sitingcases/genesis_solar/documents/applicant/2009-12-15_Data_Responses_to_Set_1A_TN-54453.pdf. Accessed November 9, 2011.

CRBC (Colorado River Board of California: The Resources Agency, State of California). 2000. California's Colorado River Water Use Plan, DRAFT. May 11. [online]: http://www.crb.ca.gov/Calif_Plan%20May%2011%20Draft.pdf. Accessed November 9, 2011.

Colorado River Basin RWQCB (Regional Water Quality Control Board). 2006b. Water Quality Control Plan, Colorado River Basin – Region 7. Includes Amendments Adopted by the Regional Board through June. [online]: http://www.swrcb.ca.gov/rwqcb7/publications_forms/publications/docs/basinplan_2006.pdf. Accessed November 9, 2011.

DWR (California Department of Water Resources). 2011a. Groundwater Glossary. [website]: http://www.water.ca.gov/groundwater/groundwater_glossary.cfm. Accessed November 9, 2011.

_____. 2011b. Groundwater: Conjunctive Use. [online]: http://www.cd.water.ca.gov/groundwater/conjunctiveuse.cfm. Accessed November 7, 2011.

_____. 2004a. California's Groundwater Bulletin 118: Hydrologic Region Colorado River, Chuckwalla Valley Groundwater Basin. [online]: http://www.water.ca.gov/pubs/groundwater/bulletin_118/basindescriptions/7-5.pdf. Accessed November 9, 2011.

_____. 2004b. California's Groundwater Bulletin 118: Hydrologic Region Colorado River, Pinto Valley Groundwater Basin. [online]: http://www.water.ca.gov/pubs/groundwater/bulletin_118/basindescriptions/7-6.pdf. Accessed November 9, 2011.

_____. 2004c. California's Groundwater Bulletin 118: Hydrologic Region Colorado River, Cadiz Valley Groundwater Basin. [online]: http://www.water.ca.gov/pubs/groundwater/bulletin_118/basindescriptions/7-6.pdf. Accessed November 9, 2011.

_____. 2004d. California's Groundwater Bulletin 118: Hydrologic Region Colorado River, Orocopia Valley Groundwater Basin. [online]: http://www.water.ca.gov/pubs/groundwater/bulletin_118/basindescriptions/7-31.pdf. Accessed November 9, 2011.

_____. 2004e. California's Groundwater Bulletin 118: Hydrologic Region Colorado River, Palo Verde Valley Groundwater Basin. [online]: http://www.water.ca.gov/pubs/groundwater/bulletin_118/basindescriptions/7-39.pdf. Accessed November 9, 2011.

_____. 2003. Guidebook for Implementation of Senate Bill 610 and Senate Bill 221 of 2001. [online]: http://www.water.ca.gov/pubs/use/sb_610_sb_221_guidebook/guidebook.pdf. Accessed April November 7, 2011.

ECE (Eagle Crest Energy). 2008. Eagle Mountain Pumped Storage Project Draft License Application. Exhibit E, Volume 1, Public Information. June 16. [online]: http://www.eaglemountainenergy.us/pdfs/Exhibit_E_080616.pdf. Accessed November 8, 2011.

ESA (Environmental Science Associates). 2011. Cadiz Project Draft EIR. December. [online]: http://www.smwd.com/assets/downloads/cadiz/Cadiz_Draft_Environmental_Impact_Report.pdf. Accessed August 7, 2012.

FERC (Federal Energy Regulatory Commission). 2012. Final Environmental Impact Statement for the Proposed Eagle Mountain Pumped Storage Hydroelectric Project. Issued: January 30. [online]: http://www.ferc.gov/industries/hydropower/enviro/eis/2012/013012/section-3.pdf. Accessed March 14, 2012.

Godfrey, G., Ludwig, N., Salve, R. 2012. Groundwater and Large-Scale Renewable Energy Projects on Federal Land: Chuckwalla Valley Groundwater Basin. Arizona Hydrological Society 2012 Annual Water Symposium. September.

Moute & Polyzoides Architects and Urbanists, Van Atta Associates, Nelson / Nygaard Associates, Psomas, Syska Hennessy Group, Environmental Planning & Design, Historic Resources Group. 2008. Occidental College Master Plan: Appendix G, MWD and LADWP Plans and Programs to Secure Future Water Supplies. [online]: http://cityplanning.lacity.org/EIR/OccidentalCollege/DEIR/Chapters/Appendix%20G%20Water%20Supply.pdf. Accessed November 7, 2011.

Riverside County. 2008. County of Riverside General Plan. Chapter 5: Multipurpose Open Space Element. [online]: http://www.tlma.co.riverside.ca.us/genplan/general_plan_2008/general_plan/Chapter_5_Multipurpose_Open_Space_Element_2008.pdf. Accessed November 9, 2011.

UBC (Uniform Building Code). 1997. Volume 2, Chapter 16: Structural Design Requirements.

USGS (United States Geological Survey). 2007. Geological Survey Water-Supply Paper 1475-0: Hydrologic and Geologic Reconnaissance of Pinto Basin Joshua Tree National Monument, Riverside County, California. Water Resources: Groundwater. [online]: http://www.nps.gov/history/history/online_books/geology/publications/wsp/1475-O/sec2.htm. Accessed November 9, 2011.

WorleyParsons. 2009. Technical Memorandum – Groundwater Resources Cumulative Impact Analysis for Genesis Solar Power Project, Riverside County, CA. December 31. [online]: http://www.energy.ca.gov/sitingcases/genesis_solar/documents/applicant/2009-12-31_Cumulative_Impact_Analysis_TN-54673.pdf. Accessed November 4, 2011.

ATTACHMENT A

DWR Guidebook for Implementation of Senate Bill 610

The Water Supply Assessment (WSA) for the proposed Desert Harvest Solar Project ("proposed project") was prepared using guidance contained in the California Department of Water Resources' (DWR) *Guidebook for Implementation of Senate Bill 610 and Senate Bill 221 of 2001* (DWR Guidebook). The California DWR prepared the Guidebook to assist water suppliers in preparation of the water assessments and the written verification of water supply availability required by Senate Bill 610 and SB 221; the DWR has no regulatory or permitting approval authority concerning water assessments or verifications of sufficient water supply, and provides the Guidebook purely as an assistance tool (DWR 2003). The following table provides a detailed description of how the DWR Guidebook was used in preparing the proposed project's WSA.

Table WSA-A1. DHSP WSA Consistency with DWR Guidelines

Guidelines Section Number and Title (DWR 2003)	Guidelines Direction	Relevant WSA Section and Response
Section 1 (page 2). Does SB 610 or SB 221 apply to the proposed project?	*Is the project subject to SB 610?* *Is the project subject to CEQA (Water Code §10910(a))? If yes, continue.*	WSA Section 4.1 Yes, the project is subject to CEQA.
	Is it a "Project" as defined by Water Code §10912(a) or (b)? If yes, to comply with SB 610 go to Section 2, page 4.	WSA Section 4.2 Yes, the proposed project is considered to meet the definition of "project" per Water Code §10912(a) or (b).
	Is the project subject to SB 221? *Does the tentative map include a "subdivision" as defined by Government Code §66473.7(a)(1)? If no, stop.*	No, the proposed project does not include a "subdivision;" SB 221 does not apply to the proposed project, and no further action relevant to SB 221 is required.
Section 2 (page 4). Who will prepare the SB 610 analysis?	*Is there a public water system ("water supplier") for the project (Water Code §10910(b))? If no, go to Section 3, page 6.*	WSA Section 4.3 No, there is no public water system present that would be used to meet the proposed project's water supply requirements.
Section 3 (page 6). Has an assessment already been prepared that includes this project?	*Has this project already been the subject of an assessment (Water Code §10910(h))? If no, go to Section 4, page 8.*	No, the proposed project has not been the subject of an assessment.
Section 4 (page 8). Is there a current Urban Water Management Plan?	*Is there an adopted urban water management plan (Water Code §10910(c))? If yes, continue.* *If yes, information from the UWMP related to the proposed water demand for the project may also be used for carrying out Section 5, Steps 1 and 2, and Section 7; proceed to Section 5, page 10 of the Guidelines.*	WSA Section 4.4 The proposed project site is not addressed in an existing UWMP.

Table WSA-A1. DHSP WSA Consistency with DWR Guidelines

Guidelines Section Number and Title (DWR 2003)	Guidelines Direction	Relevant WSA Section and Response
	Is the projected water demand for the project accounted for in the most recent UWMP (Water Code §10910(c)(2))? If no, go to Section 5, page 10.	WSA Section 4.4 The proposed project site is not addressed in an existing UWMP.
Section 5 (page 10). What information should be included in an assessment?	*Step One (page 13). Documenting wholesale water supplies.*	The proposed project does not include the use of any wholesale water supplies.
	Step Two (page 17). Documenting Supply if Groundwater is a Source.*	The Chuckwalla Valley Groundwater Basin is a proposed water supply.
	a) Specify if a groundwater management plan or any other specific authorization for groundwater management for the basin has been adopted and how it affects the water supplier's use of the basin.	WSA Section 3.3 No comprehensive groundwater management plan currently exists for the Chuckwalla Valley Groundwater Basin.
	b) The description of the groundwater basin may be excerpted from the groundwater management plan, from DWR Bulletin 118, California's Ground Water, or from some other document that has been published and that discusses the basin boundaries, type of rock that constitutes the aquifer, variability of the aquifer material, and total groundwater in storage (average specific yield times the volume of the aquifer).	WSA Chapter 3 of the WSA provides a description of the groundwater basin characteristics using all available resources, including DWR Bulletin 118.
	c) In an adjudicated basin the amount of water the urban supplier has the legal right to pump should be enumerated in the court decision.	WSA Chapter 3 The Chuckwalla Valley Groundwater Basin is not adjudicated.
	d) The Department of Water Resources has projected estimates of overdraft, or "water shortage," based on projected amounts of water supply and demand (basin management), at the hydrologic region level in Bulletin 160, California Water Plan Update. Estimates at the basin or subbasin level will be projected for some basins in Bulletin 118. If the basin has not been evaluated by DWR, data that indicate groundwater level trends over a period of time should be collected and evaluated.	WSA Section 3.1 DWR Bulletin 118 has not projected estimates of overdraft specific to the Chuckwalla Valley Groundwater Basin. Groundwater level trends are discussed in WSA Section 3.1.

Table WSA-A1. DHSP WSA Consistency with DWR Guidelines

Guidelines Section Number and Title (DWR 2003)	Guidelines Direction	Relevant WSA Section and Response
	e) If the evaluation indicates an overdraft due to existing groundwater extraction, or projected increases in groundwater extraction, describe actions and/or program designed to eliminate the long term overdraft condition	WSA Section 4.6 The evaluation does indicate projected overdraft conditions. Actions and programs that would minimize or avoid overdraft conditions are discussed in WSA Section 4.6 and Chapter 5.
	f) If water supplier wells are plotted on a map, or are available from a geographic information system, the amount of water extracted by the water supplier for the past five years can be obtained from the Department of Health Services, Office of Drinking Water and Environmental Management.	Water pumping on the project site for the proposed project would not initiate until the onset of construction activities; site-specific historical records are not available.
	g) Description and analysis of the amount and location of groundwater pumped by the water supplier for the past five years. Include information on proposed pumping locations and quantities. The description and analysis is to be based on information that is reasonably available, including, but not limited to, historic use records from DWR.	WSA Chapter 2 (Project Description) of the WSA provides a description of the amount and location of groundwater to be pumped for the proposed project. Section 4.6 (see “Project Demands”) of the WSA further addresses the proposed project’s pumping requirements. Historic groundwater trends are described in WSA Section 3.1.
	h) Analysis of the location, amount, and sufficiency of groundwater that is projected to be pumped by the water supplier.	WSA Chapter 2 and Section 3.1 Water from the Chuckwalla Valley Groundwater Basin would be treated through an on-site reverse osmosis system prior to use for panel washing under the proposed project.
	Step 3 (page 21). Documenting project demand (Project Demand Analysis).	WSA Section 4.6 Construction of the proposed project would require 400.51 to 500.51 afy, while operation would require 26.02 to 39.02 afy.
	Step 4 (page 26). Documenting dry year(s) supply.	WSA Section 4.6, see “Groundwater Supply Availability Projections” and Tables WSA-9 through WSA-15.
	Step 5 (page 31). Documenting dry year(s) demand.	WSA Section 4.6, see “Groundwater Supply Availability Projections” and Tables WSA-9 through WSA-15.
Section 6 (page 33). Is the projected water supply sufficient or insufficient for the proposed project?		WSA Chapter 5 (Conclusions) Overdraft conditions are projected to occur during implementation of the proposed project, but sufficient water supplies are available in the are to meet the proposed project’s water requirements.

Table WSA-A1. DHSP WSA Consistency with DWR Guidelines

Guidelines Section Number and Title (DWR 2003)	Guidelines Direction	Relevant WSA Section and Response
Section 7 (page 35). If the projected supply is determined to be insufficient.	*Does the assessment conclude that supply is "sufficient"? If no, continue.*	WSA Section 4.6 and Chapter 5 Sufficient water supplies are available for the proposed project.
Section 8 (page 38). Final SB 610 assessment actions by lead agencies.	*The lead agency shall review the WSA and must decide whether additional water supply information is needed for its consideration of the proposed project. The lead agency "shall determine, based on the entire record, whether projected water supplies will be sufficient to satisfy the demands of the project, in addition to existing and planned future uses."*	The WSA for the proposed project will be included as part of the Draft EIS for the proposed project. Per SB 610, the lead agency will approve or disapprove a project based on a number of factors, including but not limited to the water supply assessment.

Appendix E.2

RWQCB Letter

Scott White

From: Jay Mirpour <JMirpour@waterboards.ca.gov>
Sent: Tuesday, June 26, 2012 10:48 AM
To: Jared Varonin
Cc: lcox@s37consultants.com; John Carmona
Subject: RE: 401 Water Quality Certification Question - Desert Center, CA

Hello Mr. Varonin:

Based on the following information that you provided on 6/22/2012, it appears that neither a 401 Water Quality Certification nor waste discharge requirements is necessary:

a) USACE's letter dated May 29, 2012 stating that no "Waters of the U.S." occur within the project boundaries.
b) CDFG will take jurisdiction over all on-site drainages/washes.

Thank you

Jay Mirpour

>>> Jared Varonin <Jvaronin@aspeneg.com> 6/22/2012 2:00 PM >>>
Mr. Mirpour,

In our last correspondence this past December (2011) you had indicated that prior to determining whether or not the Desert Harvest project was exempt from obtaining a 401 and /or WDR you needed to first find out whether or not CDFG and/or the USACE would be asserting jurisdiction over the on-site desert washes. We have completed that process with the USACE and attached to this email is a letter from the USACE stating that no "Waters of the U.S." occur within the project boundaries. While we have not yet completed the permitting process with CDFG they have indicated that they will be taken jurisdiction over all on-site drainages/washes. Is this information sufficient for you to determining whether or not the Desert Harvest project is exempt from the 401 and /or WDR process? Please let me know if you have any questions or need additional information.

Thanks,

Jared

Jared Varonin
Biologist/Ecologist
Certified Fisheries Professional
Aspen Environmental Group
5020 Chesebro Road, Suite 200
Agoura Hills, CA 91301

Phone: 818.338.6715
Cell: 805.302.8195
Fax: 818.597.8001
jvaronin@aspeneg.com
www.aspeneg.com

-----Original Message-----
From: Jay Mirpour [mailto:JMirpour@waterboards.ca.gov]
Sent: Friday, December 02, 2011 1:54 PM
To: jared varonin
Cc: John Carmona
Subject: RE: 401 Water Quality Certification Question - Desert Center, CA

Thank you Mr. Varonin:

It is very difficult to exempt a project not reviewing the application and supplemental information.

Once you receive answers from both agencies, please contact us and we'll see whether you will need to submit an application or provided information will be sufficient to determine that 401 or WDR required.

Thanks

Jay

Jay J. Mirpour
Water Resources Control Engineer
California Regional Water Quality Control Board Colorado River Basin Region - 7
73-720 Fred Waring Drive, Suite 100
Palm Desert, CA 92260
Ph: (760) 776-8981
Fax: (760) 341-6820
E-mail: jmirpour@waterboards.ca.gov

>>> jared varonin <JVaronin@aspeneg.com> 12/2/2011 1:36 PM >>>
Thank you for such a quick response. We are currently seeking written confirmation from the Corps as to on-site drainages. Given the fact the same drainages occurring on the adjacent project flow through our site, and the Corps determined that those drainages were not federal jurisdictional waters, we are expecting the same result for our request. We have mapped all the drainages on-site and they do qualify as Waters of the State so we will be seeking permit from CDFG. CDFG will be involved in the development of the mitigation plan for the project.

Once we have confirmation from the USACE that the waters are not federally jurisdictional, would we still need to complete a 401 application for your review or could we send you a written request for confirmation that a 401 will not be required, with the Corps letter attached?

Thanks,

Jared

Jared Varonin
Biologist/Ecologist
Certified Fisheries Professional
Aspen Environmental Group

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Agoura Hills, CA 91301

Phone: 818.338.6715
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www.aspeneg.com

-----Original Message-----
From: Jay Mirpour [mailto:JMirpour@waterboards.ca.gov]
Sent: Friday, December 02, 2011 1:30 PM
To: jared varonin
Cc: John Carmona
Subject: Re: 401 Water Quality Certification Question - Desert Center, CA

Hello Mr. Varonin:

Have you contacted the US Army Corps of Engineers? If they require you to get a 404, then you will need to receive a 401 from our office.

Have you also contacted the CA dept. of Fish & Game? If only the Waters of State is impacted (means no 404 required) and you have addressed your mitigation plans and they have approved it, then there may be no need to receive a 401 or WDR from us.

The best way to approach your project is first to contact the US Army Corps of Engineers and then submit a 401 application to us to review.

Thanks

Jay

Jay J. Mirpour
Water Resources Control Engineer
California Regional Water Quality Control Board
Colorado River Basin Region - 7
73-720 Fred Waring Drive, Suite 100
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Fax: (760) 341-6820
E-mail: jmirpour@waterboards.ca.gov

>>> jared varonin <JVaronin@aspeneg.com> 12/2/2011 11:18 AM >>>
Dear Mr. Mirpour,

I left you a voice mail yesterday but thought it might be easier/quicker for you to respond via email. I am working on a solar project in the Desert Center area west of Blythe going by the name of "Desert Harvest." This project is located adjacent to another solar project currently under construction by the name of "Desert Sunlight." The Final Record of Decision for the Desert Sunlight project determined/stated that "In the absence of Waters of the U.S., a CWA Section 401 Certification from the Colorado Basin Water Quality Control Board (RWQCB) will not be required." The footprint for the new Desert Harvest project is considerably smaller than Desert Sunlight and lies within the same watershed that drains to Palen Dry Lake. We have completed a delineation of all potentially jurisdictional waters on-site and, like with the findings of the Desert Sunlight project, have determined that the ephemeral desert dry washes present within the project site would be considered non-jurisdictional under the Clean Water Act.

I wanted to confirm with you that, as with the Desert Sunlight project, the Desert Harvest project would not be required to obtain a 401 Water Quality Certification from the water board. I have attached a PDF of one of the figures from the FEIS for Desert Sunlight. The DEIS for Desert Harvest is not out yet so I can't release any project specific figures at this time. On the figure you will see the Desert Sunlight study area in the top left corner. I drew a red ellipse just below this area to indicate the location of the Desert Harvest project. The northern extent of the project runs along the fence line of the Desert Sunlight projects southwest corner but does not extend as far east as Desert Sunlight.

If you could just confirm for me that, as with Desert Sunlight, Desert Harvest would not be required to obtain a 401 Water Quality Certification I would greatly appreciate it. Please call me if you have any questions.

Thanks,

Jared Varonin

Jared Varonin
Biologist/Ecologist
Certified Fisheries Professional
Aspen Environmental Group
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Appendix F

Noise Calculations

California Vehicle Noise Calculation: Construction Traffic (ALL)

Project Number: 3133.002
Project Name: Desert Harvest Solar Project
Model Description: Reference Energy Mean Emission Levels (REMEL) for California Vehicle Noise, Caltrans Technical Noise Supplement (11/09): Figure 5-9
Model Assumptions: no shielding, no barrier, no traffic flow adjustment (result : highest noise); uniform vehicle class mix
Scenarios: Leq(h) from hour vph; CNEL from ADT vpd-distributed per time fractions

Existing Conditions I-10 West of Highway 177

			Vehicle Distribution Fractions				Number of Hours: (hrs)		
			HD Tks	MD Tks	Autos		7am-7pm	7pm-10pm	10pm-7am
Distance: >15m Ref:	15.0	(m)	34.29	5.16	60.55	Fraction	12	3	9
Drop-off (alpha 0.5=soft, 0=hard):	0.00	(alpha)	85.2	81.9	75.5	REMEL (dBA)	**Backgd Traffic: (%)**		
Speed:	65	(mph)					7am-7pm	7pm-10pm	10pm-7am
	105	(kph)					91	4.7	4.3

SEGMENT/CONDITION	Autos Count (vpd)	Peak (vph)	Av Day Hr (vph)	Av Eve Hr (vph)	Av Nite Hr (vph)	Leq(h) Peak (dBA)	Leq(h) Av Day Hr (dBA)	Leq(h) Av Eve Hr (dBA)	Leq(h) Av Nite Hr (dBA)	CNEL (dBA)	*65 Contour XX CNEL (ft)*	*60 Contour YY CNEL (ft)*	*55 Contour ZZ CNEL (ft)*
I-10 west of Highway 177	23000	2300.0	1744.2	360.3	109.9	81.72	80.52	73.67	68.51	79.6	*466.0*	*1004.1*	*2163.2*

Source: Desert Sunlight Solar Farm Project Final EIS (April 2011) Appendix E, Noise Analysis, Tables E2-1 and E2-2.

Existing + DHSP: I-10 West of Highway 177

			Vehicle Distribution Fractions				Number of Hours: (hrs)		
			HD Tks	MD Tks	Autos		7am-7pm	7pm-10pm	10pm-7am
Distance: >15m Ref:	15.0	(m)	33.93	5.04	61.03	Fraction	12	3	9
Drop-off (alpha 0.5=soft, 0=hard):	0.00	(alpha)	85.2	81.9	75.5	REMEL (dBA)	**Backgd Traffic: (%)**		
Speed:	65	(mph)					7am-7pm	7pm-10pm	10pm-7am
	105	(kph)					90.4	4.6	5.0

SEGMENT/CONDITION	Autos Count (vpd)	Peak (vph)	Av Day Hr (vph)	Av Eve Hr (vph)	Av Nite Hr (vph)	Leq(h) Peak (dBA)	Leq(h) Av Day Hr (dBA)	Leq(h) Av Eve Hr (dBA)	Leq(h) Av Nite Hr (dBA)	CNEL (dBA)	*65 Contour XX CNEL (ft)*	*60 Contour YY CNEL (ft)*	*55 Contour ZZ CNEL (ft)*
I-10 west of Highway 177	23550	2355.0	1774.3	363.3	129.8	81.79	80.56	73.67	69.20	79.9	*482.9*	*1040.4*	*2241.5*

Existing Conditions I-10 East of Highway 177

			Vehicle Distribution Fractions				Number of Hours: (hrs)		
			HD Tks	MD Tks	Autos		7am-7pm	7pm-10pm	10pm-7am
Distance: >15m Ref:	15.0	(m)	37.79	5.61	56.60	Fraction	12	3	9
Drop-off (alpha 0.5=soft, 0=hard):	0.00	(alpha)	85.2	81.9	75.5	REMEL (dBA)	**Backgd Traffic: (%)**		
Speed:	65	(mph)					7am-7pm	7pm-10pm	10pm-7am
	105	(kph)					91	4.7	4.3

SEGMENT/CONDITION	Autos Count (vpd)	Peak (vph)	Av Day Hr (vph)	Av Eve Hr (vph)	Av Nite Hr (vph)	Leq(h) Peak (dBA)	Leq(h) Av Day Hr (dBA)	Leq(h) Av Eve Hr (dBA)	Leq(h) Av Nite Hr (dBA)	CNEL (dBA)	*65 Contour XX CNEL (ft)*	*60 Contour YY CNEL (ft)*	*55 Contour ZZ CNEL (ft)*
I-10 east of Highway 177	21400	2140.0	1622.8	335.3	102.2	81.73	80.52	73.68	68.52	79.7	*466.4*	*1004.8*	*2164.8*

Source: Desert Sunlight Solar Farm Project Final EIS (April 2011) Appendix E, Noise Analysis, Tables E2-1 and E2-3.

Source: Desert Sunlight Data, Table E2-1

I-10 West of SR-177	**Existing**	**DS Alt 1&2 2012**	**Delta**	
ADT	23000	23157	157	
MD-Truck % of ADT	5.16%	5.50%		
HD-Truck % of ADT	34.29%	35.40%		
MD-Trucks	1187	1274	87	
HD-Trucks	7887	8198	311	
Autos	13927	13686	-241	ODD

I-10 West of SR-177		**Existing**	**Project**	**E+P**
	MD-Trucks	1187	0	1187
	HD-Trucks	7887	104	7991
	Autos	13926	446	14372
	TOTAL	23000	550	23550
			MD-Truck % of ADT	5.04%
			HD-Truck % of ADT	33.93%
			Auto % of ADT	61.03%
			check	100.00%

Traffic Hours	Existing	Project	E+P	Traffic %
7am-7pm	20930	362	21292	90.4
7pm-10pm	1081	9	1090	4.6
10pm-7am	989	179	1168	5.0
check	23000	550	23550	100

Basis: Traffic Study, Appendix B (1/19/2012). Peak of 250 workers. 54 people in Normal Crew carpool.
Employee trips 446 total. 10pm-7am=155 (34.8%); 7am-7pm=286 (64.1%); 7-10pm = 5 (1.1%) trips.
Basis for Equipment: Traffic Study, Distribution of Construction Traffic by Time of Day (1/19/2012).
Concrete truck PCE = 180/3 = 60 HD trips/day; Large Equipment PCE = 131/3 = 44 HD trips/day (Total 104).

Source: Desert Sunlight Data, Table E2-1

I-10 East of SR-177	Existing Conditions	DS Alt 1&2 2012	Delta	
ADT	21400	21485	85	
MD-Truck % of ADT	5.61%	6.0%		
HD-Truck % of ADT	37.79%	40.3%		
MD-Trucks	1201	1289	89	
HD-Trucks	8087	8658	571	
Autos	12112	11537	-575	ODD

I-10 East of SR-177		**Existing**	**Project**	**E+P**
	MD-Trucks	1201	0	1201
	HD-Trucks	8087	104	8191

Existing + DHSP: I-10 East of Highway 177

			Vehicle Distribution Fractions				Number of Hours: (hrs)		
			HD Tks	MD Tks	Autos		7am-7pm	7pm-10pm	10pm-7am
Distance: >15m Ref:	15.0	(m)	37.32	5.47	57.21	Fraction	12	3	9
Drop-off (alpha 0.5=soft, 0=hard):	0.00	(alpha)	85.2	81.9	75.5	REMEL (dBA)	Backgd Traffic: (%)		
Speed:	65	(mph)					7am-7pm	7pm-10pm	10pm-7am
	105	(kph)					90.4	4.6	5.0

SEGMENT/CONDITION	Autos Count (vpd)	Peak (vph)	Av Day Hr (vph)	Av Eve Hr (vph)	Av Nite Hr (vph)	Leq(h) Peak (dBA)	Leq(h) Av Day Hr (dBA)	Leq(h) Av Eve Hr (dBA)	Leq(h) Av Nite Hr (dBA)	CNEL (dBA)	65 Contour XX CNEL (ft)	60 Contour YY CNEL (ft)	55 Contour ZZ CNEL (ft)
I-10 east of Highway 177	21950	2195.0	1653.0	338.3	122.1	81.79	80.56	73.67	69.25	79.9	*484.1*	*1043.0*	*2247.1*

Autos	12112	446	12558	
TOTAL	21400	550	21950	
		MD-Truck % of ADT	5.47%	
		HD-Truck % of ADT	37.32%	
		Auto % of ADT	57.21%	
		check	100.00%	

Traffic Hours	Existing	Project	E+P	Traffic %
7am-7pm	19474	362	19836	90.4
7pm-10pm	1006	9	1015	4.6
10pm-7am	920	179	1099	5.0
check	21400	550	21950	100

Basis: Traffic Study, Appendix B (1/19/2012). Peak of 250 workers. 54 people in Normal Crew carpool.
Employee trips 446 total. 10pm-7am=155 (34.8%); 7am-7pm=286 (64.1%); 7-10pm = 5 (1.1%) trips.
Basis for Equipment: Traffic Study, Distribution of Construction Traffic by Time of Day (1/19/2012).
Concrete truck PCE = 180/3 = 60 HD trips/day; Large Equipment PCE = 131/3 = 44 HD trips/day (Total 104).

Existing Conditions Highway 177 South of Kaiser Road

			Vehicle Distribution Fractions				Number of Hours: (hrs)		
			HD Tks	MD Tks	Autos		7am-7pm	7pm-10pm	10pm-7am
Distance: >15m Ref:	15.0	(m)	27.5	10.9	61.6	Fraction	12	3	9
Drop-off (alpha 0.5=soft, 0=hard):	0.00	(alpha)	83.0	79.0	71.1	REMEL (dBA)	Backgd Traffic: (%)		
Speed:	50	(mph)					7am-7pm	7pm-10pm	10pm-7am
	80	(kph)					70.60	8.48	20.92

SEGMENT/CONDITION	Autos Count (vpd)	Peak (vph)	Av Day Hr (vph)	Av Eve Hr (vph)	Av Nite Hr (vph)	Leq(h) Peak (dBA)	Leq(h) Av Day Hr (dBA)	Leq(h) Av Eve Hr (dBA)	Leq(h) Av Nite Hr (dBA)	CNEL (dBA)	65 Contour XX CNEL (ft)	60 Contour YY CNEL (ft)	55 Contour ZZ CNEL (ft)
Highway 177 south of Kaiser Road	2925	292.5	172.1	82.7	68.0	70.90	68.59	65.41	64.56	72.0	*143.2*	*308.5*	*664.6*

Source: Desert Harvest Traffic Study (Dec 2011), Appendix B, Traffic Counts.

Source: Desert Sunlight Data, Table E2-1

SR-177 s.o. Kaiser Rd.	Existing Conditions	DS Alt 1&2 2012	Delta
ADT	2250	2475	225
MD-Truck % of ADT	4.40%	5.7%	
HD-Truck % of ADT	9.60%	9.5%	
MD-Trucks	99	141	42
HD-Trucks	216	235	19
Autos	1935	2099	164

EXISTING TRAFFIC COUNTS 22-Nov-11 (SR-177 between I-10 WB ramp and Kaiser Rd.)

SR-177 s.o. Kaiser Rd.	**Existing**	**Project**	**E+P**
MD-Trucks	318	0	318
HD-Trucks	804	104	908
Autos	1803	446	2249
TOTAL	2925	550	3475
		MD-Truck % of ADT	9.2%
		HD-Truck % of ADT	26.1%
		Auto % of ADT	64.7%
		check	100.0%

Existing + DHSP: Highway 177 South of Kaiser Road

			Vehicle Distribution Fractions				Number of Hours: (hrs)		
			HD Tks	MD Tks	Autos		7am-7pm	7pm-10pm	10pm-7am
Distance: >15m Ref:	15.0	(m)	26.13	9.15	64.72	Fraction	12	3	9
Drop-off (alpha 0.5=soft, 0=hard):	0.00	(alpha)	83.0	79.0	71.1	REMEL (dBA)	Backgd Traffic: (%)		
Speed:	50	(mph)					7am-7pm	7pm-10pm	10pm-7am
	80	(kph)					69.8	7.4	22.8

SEGMENT/CONDITION	Autos Count (vpd)	Peak (vph)	Av Day Hr (vph)	Av Eve Hr (vph)	Av Nite Hr (vph)	Leq(h) Peak (dBA)	Leq(h) Av Day Hr (dBA)	Leq(h) Av Eve Hr (dBA)	Leq(h) Av Nite Hr (dBA)	CNEL (dBA)	65 Contour XX CNEL (ft)	60 Contour YY CNEL (ft)	55 Contour ZZ CNEL (ft)
Highway 177 south of Kaiser Road	3475	347.5	202.3	85.7	87.9	71.41	69.06	65.33	65.44	72.7	*159.8*	*344.2*	*741.6*

Traffic Hours	Existing	Project	E+P	Traffic %
7am-7pm	2065	362	2427	69.8
7pm-10pm	248	9	257	7.4
10pm-7am	612	179	791	22.8
check	2925	550	3475	100

Basis: Traffic Study, Appendix B (1/19/2012). Peak of 250 workers. 54 people in Normal Crew carpool.
Employee trips 446 total. 10pm-7am=155 (34.8%); 7am-7pm=286 (64.1%); 7-10pm = 5 (1.1%) trips.
Basis for Equipment: Traffic Study, Distribution of Construction Traffic by Time of Day (1/19/2012).
Concrete truck PCE = 180/3 = 60 HD trips/day; Large Equipment PCE = 131/3 = 44 HD trips/day (Total 104).

Existing + DHSP + DS: Highway 177 South of Kaiser Road

			Vehicle Distribution Fractions				Number of Hours: (hrs)		
			HD Tks	MD Tks	Autos		7am-7pm	7pm-10pm	10pm-7am
Distance: >15m Ref:	15.0	(m)	25.05	9.73	65.22	Fraction	12	3	9
Drop-off (alpha 0.5=soft, 0=hard):	0.00	(alpha)	83.0	79.0	71.1	REMEL (dBA)	**Backgd Traffic: (%)**		
Speed:	50	(mph)					7am-7pm	7pm-10pm	10pm-7am
	80	(kph)					68.9	6.9	24.2

	Autos Count (vpd)	Peak (vph)	Av Day Hr (vph)	Av Eve Hr (vph)	Av Nite Hr (vph)	Leq(h) Peak (dBA)	Leq(h) Av Day Hr (dBA)	Leq(h) Av Eve Hr (dBA)	Leq(h) Av Nite Hr (dBA)	CNEL (dBA)	65 Contour XX CNEL (ft)	60 Contour YY CNEL (ft)	55 Contour ZZ CNEL (ft)
SEGMENT/CONDITION													
Highway 177 south of Kaiser Road	3700	370.0	212.4	85.7	99.3	71.58	69.17	65.22	65.87	73.0	*167.8*	*361.6*	*779.1*

CUMULATIVE

SR-177 s.o. Kaiser Rd.	**E+P**	**Desert Sunlight**	**E+P+DS**
MD-Trucks	318	42	360
HD-Trucks	908	19	927
Autos	2249	164	2413
TOTAL	3475	225	3700
		MD-Truck % of ADT	9.73%
		HD-Truck % of ADT	25.05%
		Auto % of ADT	65.22%
		check	100.00%

Traffic Hours	E+P	Desert Sunlight	E+P+DS	Traffic %
7am-7pm	2427	122	2549	68.9
7pm-10pm	257	0	257	6.9
10pm-7am	791	103	894	24.2
check	3475	225	3700	100

Basis: Desert Sunlight FEIS, Section 4.10 "Construction truck traffic was assumed to be all heavy trucks, and to occur between 7:00 AM and 3:00 PM. Construction-related worker commute traffic was assumed to be a mix of light duty vehicles and medium trucks (shuttle buses). All arriving worker commute traffic was assumed to occur between 6:00 AM and 7:00 AM, and to depart between 3:00 PM and 4:00 PM.

Existing Conditions Kaiser Road South of Lake Tamarisk

			Vehicle Distribution Fractions				Number of Hours: (hrs)		
			HD Tks	MD Tks	Autos		7am-7pm	7pm-10pm	10pm-7am
Distance: >15m Ref:	15.0	(m)	17.30	14.40	68.40	Fraction	12	3	9
Drop-off (alpha 0.5=soft, 0=hard):	0.00	(alpha)	82.1	77.8	69.3	REMEL (dBA)	**Backgd Traffic: (%)**		
Speed:	45	(mph)					7am-7pm	7pm-10pm	10pm-7am
	72	(kph)					79.68	4.14	16.19

	Autos Count (vpd)	Peak (vph)	Av Day Hr (vph)	Av Eve Hr (vph)	Av Nite Hr (vph)	Leq(h) Peak (dBA)	Leq(h) Av Day Hr (dBA)	Leq(h) Av Eve Hr (dBA)	Leq(h) Av Nite Hr (dBA)	CNEL (dBA)	65 Contour XX CNEL (ft)	60 Contour YY CNEL (ft)	55 Contour ZZ CNEL (ft)
SEGMENT/CONDITION													
Kaiser Road south of Lake Tamarisk	556	55.6	36.9	7.7	10.0	61.91	60.13	53.31	54.46	62.2	*31.9*	*68.6*	*147.9*

Source: Desert Harvest Traffic Study (Dec 2011), Appendix B, Traffic Counts.

Source: Desert Sunlight Data, Table E2-1

Kaiser Rd. s.o. Tamarisk Lake	Existing Conditions	Alt 1&2 2012	Delta
ADT	150	372	222
MD-Truck % of ADT	20.40%	24.8%	
HD-Truck % of ADT	6.50%	21.5%	
MD-Trucks	30	92	62
HD-Trucks	10	80	70
Autos	110	200	90

Existing + DHSP: Kaiser Road South of Lake Tamarisk

			Vehicle Distribution Fractions				Number of Hours: (hrs)		
			HD Tks	MD Tks	Autos		7am-7pm	7pm-10pm	10pm-7am
Distance: >15m Ref:	15.0	(m)	18.08	7.23	74.68	Fraction	12	3	9
Drop-off (alpha 0.5=soft, 0=hard):	0.00	(alpha)	82.1	77.8	69.3	REMEL (dBA)	**Backgd Traffic: (%)**		
Speed:	45	(mph)					7am-7pm	7pm-10pm	10pm-7am
	72	(kph)					72.8	2.9	24.3

	Autos Count (vpd)	Peak (vph)	Av Day Hr (vph)	Av Eve Hr (vph)	Av Nite Hr (vph)	Leq(h) Peak (dBA)	Leq(h) Av Day Hr (dBA)	Leq(h) Av Eve Hr (dBA)	Leq(h) Av Nite Hr (dBA)	CNEL (dBA)	65 Contour XX CNEL (ft)	60 Contour YY CNEL (ft)	55 Contour ZZ CNEL (ft)
SEGMENT/CONDITION													
Kaiser Road south of Lake Tamarisk	1106	110.6	67.1	10.7	29.9	64.64	62.47	54.48	58.95	66.0	*57.0*	*122.7*	*264.4*

EXISTING TRAFFIC COUNTS 22-Nov-11

Kaiser Rd. s.o. Tamarisk Lake	**Existing**	**Project**	**E+P**
MD-Trucks	80	0	80
HD-Trucks	96	104	200
Autos	380	446	826
TOTAL	556	550	1106
		MD-Truck % of ADT	7.23%
		HD-Truck % of ADT	18.08%
		Auto % of ADT	74.68%
		check	100.00%

Traffic Hours	Existing	Project	E+P	Traffic %
7am-7pm	443	362	805	72.8
7pm-10pm	23	9	32	2.9
10pm-7am	90	179	269	24.3
check	556	550	1106	100

Basis: Traffic Study, Appendix B (1/19/2012). Peak of 250 workers. 54 people in Normal Crew carpool. Employee trips 446 total. 10pm-7am=155 (34.8%); 7am-7pm=286 (64.1%); 7-10pm = 5 (1.1%) trips.
Basis for Equipment: Traffic Study, Distribution of Construction Traffic by Time of Day (1/19/2012).
Concrete truck PCE = 180/3 = 60 HD trips/day; Large Equipment PCE = 131/3 = 44 HD trips/day (Total 104).

Existing + DHSP + DS: Kaiser Road South of Lake Tamarisk

			Vehicle Distribution Fractions				Number of Hours: (hrs)		
			HD Tks	MD Tks	Autos		7am-7pm	7pm-10pm	10pm-7am
Distance: >15m Ref:	15.0	(m)	20.33	10.69	68.98	Fraction	12	3	9
Drop-off (alpha 0.5=soft, 0=hard):	0.00	(alpha)	82.1	77.8	69.3	REMEL (dBA)	**Backgd Traffic: (%)**		
Speed:	45	(mph)					**7am-7pm**	**7pm-10pm**	**10pm-7am**
	72	(kph)					71.6	2.4	26.0

SEGMENT/CONDITION	Autos Count (vpd)	Peak (vph)	Av Day Hr (vph)	Av Eve Hr (vph)	Av Nite Hr (vph)	Leq(h) Peak (dBA)	Leq(h) Av Day Hr (dBA)	Leq(h) Av Eve Hr (dBA)	Leq(h) Av Nite Hr (dBA)	CNEL (dBA)	*65 Contour XX CNEL (ft)*	*60 Contour YY CNEL (ft)*	*55 Contour ZZ CNEL (ft)*
Kaiser Road south of Lake Tamarisk	1328	132.8	79.3	10.7	38.3	65.96	63.72	55.01	60.57	67.5	*71.8*	*154.8*	*333.4*

CUMULATIVE

Kaiser Rd. s.o. Tamarisk Lake	**E+P**	**Desert Sunlight**	**E+P+DS**
MD-Trucks	80	62	142
HD-Trucks	200	70	270
Autos	826	90	916
TOTAL	1106	222	1328
		MD-Truck % of ADT	10.7%
		HD-Truck % of ADT	20.3%
		Auto % of ADT	69.0%
		check	100.0%

Traffic Hours	E+P	Desert Sunlight	E+P+DS	Traffic %
7am-7pm	805	146	951	71.6
7pm-10pm	32	0	32	2.4
10pm-7am	269	76	345	26.0
check	1106	222	1328	100

Basis: Desert Sunlight FEIS, Section 4.10 "Construction truck traffic was assumed to be all heavy trucks, and to occur between 7:00 AM and 3:00 PM. Construction-related worker commute traffic was assumed to be a mix of light duty vehicles and medium trucks (shuttle buses). All arriving worker commute traffic was assumed to occur between 6:00 AM and 7:00 AM, and to depart between 3:00 PM and 4:00 PM.

Existing Conditions Kaiser Road North of Lake Tamarisk

			Vehicle Distribution Fractions				Number of Hours: (hrs)		
			HD Tks	MD Tks	Autos		7am-7pm	7pm-10pm	10pm-7am
Distance: >15m Ref:	15.0	(m)	2.50	19.30	78.20	Fraction	12	3	9
Drop-off (alpha 0.5=soft, 0=hard):	0.00	(alpha)	82.1	77.8	69.3	REMEL (dBA)	**Backgd Traffic: (%)**		
Speed:	45	(mph)					**7am-7pm**	**7pm-10pm**	**10pm-7am**
	72	(kph)					82.35	3.36	14.29

SEGMENT/CONDITION	Autos Count (vpd)	Peak (vph)	Av Day Hr (vph)	Av Eve Hr (vph)	Av Nite Hr (vph)	Leq(h) Peak (dBA)	Leq(h) Av Day Hr (dBA)	Leq(h) Av Eve Hr (dBA)	Leq(h) Av Nite Hr (dBA)	CNEL (dBA)	*65 Contour XX CNEL (ft)*	*60 Contour YY CNEL (ft)*	*55 Contour ZZ CNEL (ft)*
Kaiser Road north of Lake Tamarisk	119	11.9	8.2	1.3	1.9	52.41	50.78	42.90	44.42	52.3	*7.0*	*15.2*	*32.7*

Source: Desert Harvest Traffic Study (Dec 2011), Appendix B, Traffic Counts.

Source: Desert Sunlight Data, Table E2-1

Kaiser Rd. n.o. Tamarisk Lake	Existing Conditions	Alt 1&2 2012	Delta
ADT	108	330	222
MD-Truck % of ADT	20.4%	24.8%	
HD-Truck % of ADT	6.5%	21.5%	
MD-Trucks	22	82	60
HD-Trucks	7	71	64
Autos	79	177	98

EXISTING TRAFFIC COUNTS 22-Nov-11

Kaiser Rd. n.o. Tamarisk Lake	**Existing**	**Project**	**E+P**
MD-Trucks	23	0	23
HD-Trucks	3	104	107
Autos	93	446	539
TOTAL	119	550	669
		MD-Truck % of ADT	3.4%
		HD-Truck % of ADT	16.0%
		Auto % of ADT	80.6%
		check	100.0%

Traffic Hours	Existing	Project	E+P	Traffic %
7am-7pm	98	362	460	68.8
7pm-10pm	4	9	13	1.9
10pm-7am	17	179	196	29.3
check	119	550	669	100

Basis: Traffic Study, Appendix B (1/19/2012). Peak of 250 workers. 54 people in Normal Crew carpool.
Employee trips 446 total. 10pm-7am=155 (34.8%); 7am-7pm=286 (64.1%); 7-10pm = 5 (1.1%) trips.
Basis for Equipment: Traffic Study, Distribution of Construction Traffic by Time of Day (1/19/2012).
Concrete truck PCE = 180/3 = 60 HD trips/day; Large Equipment PCE = 131/3 = 44 HD trips/day (Total 104).

Existing + DHSP: Kaiser Road North of Lake Tamarisk

			Vehicle Distribution Fractions				Number of Hours: (hrs)		
			HD Tks	MD Tks	Autos		7am-7pm	7pm-10pm	10pm-7am
Distance: >15m Ref:	15.0	(m)	15.99	3.44	80.57	Fraction	12	3	9
Drop-off (alpha 0.5=soft, 0=hard):	0.00	(alpha)	82.1	77.8	69.3	REMEL (dBA)	**Backgd Traffic: (%)**		
Speed:	45	(mph)					**7am-7pm**	**7pm-10pm**	**10pm-7am**
	72	(kph)					68.8	1.9	29.3

SEGMENT/CONDITION	Autos Count (vpd)	Peak (vph)	Av Day Hr (vph)	Av Eve Hr (vph)	Av Nite Hr (vph)	Leq(h) Peak (dBA)	Leq(h) Av Day Hr (dBA)	Leq(h) Av Eve Hr (dBA)	Leq(h) Av Nite Hr (dBA)	CNEL (dBA)	*65 Contour XX CNEL (ft)*	*60 Contour YY CNEL (ft)*	*55 Contour ZZ CNEL (ft)*
Kaiser Road north of Lake Tamarisk	669	66.9	38.3	4.3	21.8	61.85	59.44	49.97	56.98	63.7	*40.4*	*86.9*	*187.3*

Existing + DHSP + DS: Kaiser Road North of Lake Tamarisk

			Vehicle Distribution Fractions				**Number of Hours: (hrs)**		
			HD Tks	**MD Tks**	**Autos**		**7am-7pm**	**7pm-10pm**	**10pm-7am**
Distance: >15m Ref:	15.0	(m)	19.19	9.32	71.49	Fraction	12	3	9
Drop-off (alpha 0.5=soft, 0=hard):	0.00	(alpha)	82.1	77.8	69.3	REMEL (dBA)	**Backgd Traffic: (%)**		
Speed:	45	(mph)					**7am-7pm**	**7pm-10pm**	**10pm-7am**
	72	(kph)					67.7	1.5	30.9

SEGMENT/CONDITION	Autos Count (vpd)	Peak (vph)	Av Day Hr (vph)	Av Eve Hr (vph)	Av Nite Hr (vph)	Leq(h) Peak (dBA)	Leq(h) Av Day Hr (dBA)	Leq(h) Av Eve Hr (dBA)	Leq(h) Av Nite Hr (dBA)	CNEL (dBA)	*65 Contour XX CNEL (ft)*	*60 Contour YY CNEL (ft)*	*55 Contour ZZ CNEL (ft)*
Kaiser Road north of Lake Tamarisk	891	89.1	50.3	4.3	30.6	63.99	61.50	50.86	59.34	66.0	*57.3*	*123.5*	*266.1*

CUMULATIVE

Kaiser Rd. n.o. Tamarisk Lake	**E+P**	**Desert Sunlight**	**E+P+DS**	
MD-Trucks	23	60	83	
HD-Trucks	107	64	171	
Autos	539	98	637	
TOTAL	669	222	891	
		MD-Truck % of ADT	9.3%	
		HD-Truck % of ADT	19.2%	
		Auto % of ADT	71.5%	
		check	100.0%	
Traffic Hours	E+P	Desert Sunlight	E+P+DS	Traffic %
7am-7pm	460	143	603	67.7
7pm-10pm	13	0	13	1.5
10pm-7am	196	79	275	30.9
check	669	222	891	100

Basis: Desert Sunlight FEIS, Section 4.10 "Construction truck traffic was assumed to be all heavy trucks, and to occur between 7:00 AM and 3:00 PM. Construction-related worker commute traffic was assumed to be a mix of light duty vehicles and medium trucks (shuttle buses). All arriving worker commute traffic was assumed to occur between 6:00 AM and 7:00 AM, and to depart between 3:00 PM and 4:00 PM.

Appendix G

Visual Resources

Appendix G.1

Approach to Baseline Analysis

Appendix G-1

SECTION 1 - Approach to Baseline Analysis Under the BLM Visual Resource Management (VRM) System

The Federal Land Policy and Management Act of 1976 (FLPMA) identifies scenic resources as one of the resources for which public lands should be managed. In order to satisfy its responsibilities with respect to scenic resources, the BLM's Visual Resource Management (VRM) Policy establishes a visual assessment methodology to inventory and manage scenic values on lands under its jurisdiction. The BLM manual M-8400 (Visual Resource Management), Handbook H-8410 (Visual Resource Inventory), Handbook H-8431 (Visual Resource Contrast Rating), and Instruction Memorandum 2009-167 (Application of the VRM Program to Renewable Energy) set forth the policies and procedures for determining visual resource values, establishing management objectives, and evaluating proposed actions for conformance with established objectives for BLM administered public lands.

The three primary elements of the BLM's VRM Policy are: (1) determining resource values, (2) establishing management objectives, and (3) evaluating the conformance of proposed actions with those objectives (each of which is described briefly below).

- ***Determining Resource Values:*** The primary means to establish visual resource values is through a Visual Resource Inventory (VRI) that results in the assignment of one of four VRI Classes (I to IV) to represent the relative visual value of an area. VRI Class I has the highest value and VRI Class IV has the lowest. VRI Class I is reserved for special congressional designations or administrative decisions such as Wilderness Areas, visually sensitive ACECs, or Wild and Scenic Rivers, etc. VRI Classes II through IV are determined through a systematic process that documents the landscape's scenic quality, public sensitivity and visibility. Rating units for each of the three factors are mapped individually, evaluated, and then combined through an over-layering analysis. The three factors contributing to the VRI Class determination are described below. The combined factors are then cross-referenced with the VRI Matrix to determine the applicable VRI Class. VRI classes are informational in nature and provide a baseline for existing conditions. They do not establish management direction and should not be used as a basis for constraining or encouraging surface disturbing activities. They provide the baseline data for existing conditions.
- ***Establishing Management Objectives***: VRM Classes (defined below) are determined through careful consideration of VRI Class designations (visual values), land use and demands, and the resource allocations and/or management decisions made in the applicable land use plan for a given area. VRM Class designations set the level of visual change to the landscape that may be permitted for any surface-disturbing activity. The objective of VRM Class I is to preserve the character of the landscape, whereas VRM Class IV provides for activities that require major modification to the landscape. VRI Classes are not intended to automatically become VRM Class designations. VRM Classes may be different then the VRI Classes assigned during the inventory, as the former should reflect a balance between the protection of visual values and other resource use needs. For example, an area with a VRI Class II designation may be assigned a VRM Class IV designation, based on its overriding value for mineral resource extraction or its designation as a utility corridor.

- ***Evaluating Conformance:*** Finally, proposed plans of development are evaluated for conformance to the VRM Class objectives through the use of the Visual Resource Contrast Rating process set forth within BLM Handbook H-8431-1.

Factors Contributing to VRI Class Determination

VRI Class determination is based on an assessment of scenic quality, viewer sensitivity, and viewing distance zones. The following paragraphs address each of these contributing factors.

Scenic Quality is a measure of the overall impression or appeal of an area created by the physical features of the landscape, such as natural features (landforms, vegetation, water, color, adjacent scenery, and scarcity) and built features (roads, buildings, railroads, agricultural patterns, and utility lines). These features create the distinguishable form, line, color, and texture of the landscape composition that can be judged for scenic quality using criteria such as distinctiveness, contrast, variety, harmony, and balance. Table G-1-1 presents the scenic quality rating components that are evaluated to arrive at one of three scenic quality ratings (A, B, or C) for a given landscape. Each landscape component is scored, and a score of 19 or higher results in a Class A scenic quality rating. A score of 12 to 18 results in a Class B scenic quality rating, while a score of 11 or less results in a Class C scenic quality rating. The three scenic quality classes are described as follows:

- **Scenic Quality Class A** – Landscapes that combine the most outstanding characteristics of the region.
- **Scenic Quality Class B** – Landscapes that exhibit a combination of outstanding and common features.
- **Scenic Quality Class C** – Landscapes that have features that are common to the region.

Viewer Sensitivity is a factor used to represent the value of the visual landscape to the viewing public, including the extent to which the landscape is viewed. For example, a landscape may have high scenic qualities but be remotely located and, therefore, seldom viewed. Sensitivity considers such factors as visual access (including duration and frequency of view), type and amount of use (See Table G-1-2), public interest, adjacent land uses, and whether the landscape is part of a special area (e.g., California Desert Conservation Area [CDCA] or Area of Critical Environmental Concern). The three levels of viewer sensitivity can generally be defined as follows.

- **High Sensitivity.** Areas that are either designated for scenic resources protection or receive a high degree of use (includes areas visible from roads and highways receiving more than 45,000 visits [vehicles] per year). Typically within the foreground/middleground (f/m) viewing distance (see Table G-1-3).
- **Medium Sensitivity.** Areas lacking specific, or designated, scenic resources protection but are located in sufficiently close proximity to be within the viewshed of the protected area. Includes areas that are visible from roads and highways receiving 5,000 to 45,000 visits (vehicles) per year. Typically within the background (b) viewing distance (see Table G-1-3).
- **Low Sensitivity.** Areas that are remote from populated areas, major roadways, and protected areas or are severely degraded visually. Includes areas that are visible from roads and highways receiving less than 5,000 visits (vehicles) per year.

All of the BLM lands in the vicinity of the proposed project and alternatives are located within the CDCA. Because of the public importance imparted by this designation, BLM lands within the CDCA are generally assigned a High rating for Viewer Sensitivity.

Viewing Distance Zones. Landscapes are generally subdivided into three distance zones based on relative visibility from travel routes or observation points (see Table G-1-3). The f/m zone includes areas that are less than three to five miles from the viewing location. The f/m zone defines the area in which landscape details transition from readily perceived to outlines and patterns. The b zone is generally greater than five, but less than 15, miles from the viewing location. The b zone includes areas where landforms are the most dominant element in the landscape, and color and texture become subordinate. In order to be included within this distance zone, vegetation should be visible at least as patterns of light and dark. The seldom-seen (s/s) zone includes areas that are usually hidden from view as a result of topographic or vegetative screening or atmospheric conditions. In some cases, atmospheric and lighting conditions can reduce visibility and shorten the distances normally covered by each zone (BLM 1986b).

Table G-1-1. Scenic Quality Rating

Component	Scenic Quality Rating		
Landform	High vertical relief (prominent cliffs, spires, or massive rock outcrops); severe surface variation; highly eroded formations (major badlands or dune systems); detail features dominant and exceptionally striking/intriguing. **5**	Steep canyons, mesas, buttes, cinder cones, and drumlins; interesting erosional patterns or variety in size and shape of landforms; or detail features, which are interesting though not dominant or exceptional. **3**	Low rolling hills, foothills, or flat valley bottoms or few or no interesting landscape features. **1**
Vegetation	A variety of vegetative types as expressed in interesting forms, textures, and patterns. **5**	Some variety of vegetation but only one or two major types. **3**	Little or no variety or contrast in vegetation. **1**
Water	Clear and clean appearing, still, or cascading white water, any of which are a dominant factor in the landscape. **5**	Flowing, or still, but not dominant in the landscape. **3**	Absent or present but not noticeable. **0**
Color	Rich color combinations; variety or vivid color; or pleasing contrasts in the soil, rock, vegetation, water, or snow fields. **5**	Some intensity or variety in colors and contrast of the soil, rock, and vegetation but not a dominant scenic element. **3**	Subtle color variations, contrast, or interest; generally muted tones. **1**
Influence of Adjacent Scenery	Adjacent scenery greatly enhances visual quality. **5**	Adjacent scenery moderately enhances overall visual quality. **3**	Adjacent scenery has little or no influence on overall visual quality. **0**
Scarcity	One of a kind, unusually memorable, or very rare within region. Consistent chance for exceptional wildlife or wildflower viewing, etc. **5+***	Distinctive, though somewhat similar to others within the region. **3**	Interesting within its setting but fairly common within the region. **1**
Cultural Modi-fications	Modifications add favorably to visual variety while promoting visual harmony. **2**	Modifications add little or no visual variety to the area and introduce no discordant elements. **0**	Modifications add variety but are very discordant and promote strong disharmony. **- 4**
Scenic Quality Rating:	**A = 19 or more**	**B = 12 to 18**	**C = 11 or less**

* A rating of greater than 5 can be given but must be supported by written justification

Table G-1-2. Amount of Use Classifications

Type Area	High	Moderate	Low
Roads & Highways	More than 45,000 visits/yr	5,000 to 45,000 visits/yr	Less than 5,000 visits/yr
Rivers & Trails	More than 20,000 visits/yr	2,000-20,000 visits/yr	Less than 2,000 visits/yr
Recreation Sites	More than 10,000 visitor-days/yr	2,000-10,000 visitor-days/yr	Less than 2,000 visitor-days/yr

Table G-1-3. Distance Zones

f/m (foreground/middleground)...... 0 to 3–5 miles
b (background) .... 5-15 miles
s/s... seldom seen areas

Visual Resource Inventory Classes. The VRI class for a given area is typically arrived at through the use of a classification matrix similar to that presented in Table G-1-4. By comparing the scenic quality, visual sensitivity, and distance zone, the specific VRI class can be determined. The exception to this process is the Class I designation, which is placed on special areas where management activities are restricted (e.g., wilderness areas).

Table G-1-4. Visual Resource Inventory (VRI) Classification Matrix

Visual Sensitivity Levels		High			Medium			Low
Special Areas		I	I	I	I	I	I	I
Scenic Quality	**A**	II	II	II	II	II	II	II
	B	II	III	III* IV*	III	IV	IV	IV
	C	III	IV	IV	IV	IV	IV	IV
Distance Zones		**f/m**	**b**	**s/s**	**f/m**	**b**	**s/s**	**s/s**

* If adjacent areas are Class III or lower, assign Class III; if higher, assign Class IV.

The objectives of each VRI classification as stated in the BLM *Visual Resource Inventory Manual* are as follows.

- **VRI Class I.** The objective is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.
- **VRI Class II.** The objective is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
- **VRI Class III.** The objective is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate or lower. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
- **VRI Class IV.** The objective is to provide for management activities, which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements in the predominant natural features of the characteristic landscape.

Approach Under the CDCA Plan

According to BLM policy (BLM Manual H-8410-1) Interim Visual Resource Management (VRM) classes are established where a project is proposed and there are no approved VRM objectives in the applicable land use plan, as is the case for the DHSP project site which is governed by the CDCA Plan. These interim classes must 1) consider the area's visual values as summarized in the latest visual resource inventory results and 2) be consistent with the multiple-use objectives and use allocations set forth in the plan which covers the project area. While a comprehensive plan amendment is underway (Desert Renewable Energy Conservation Plan) which will establish long-term VRM classifications for the entire CDCA Plan area, the CDCA Plan currently does not have established VRM objectives. Therefore, until this landscape-level plan amendment is completed the BLM is establishing interim VRM classes consistent with H-8410-1 for project level actions within the CDCA planning area, such as the DHSP.

An analysis of scenic quality, viewer sensitivity and distance zones in the most recent Visual Resource Inventory (VRI) for the project area concluded that the inventory class is VRI II (see above for a complete discussion of VRI). The CDCA plan allocation for the project area is Multiple Use Class (MUC) M, which allows for solar electric facilities. Specific projects must be evaluated through a plan amendment to ensure consistency with all goals and objectives for this class. The conformity of the Proposed Action with the CDCA Plan's Energy Production and Utility Corridors Element Decision Criteria is shown in Table 3.22-2.

Mitigation measures VR-1 through VR-5 will be implemented to minimize the visual impacts of the project. However, the level of contrast with the surrounding landscape will still be high when viewed from a variety of vantage points including elevated viewpoints in surrounding wilderness areas and along I-10. Taking the inventory class into consideration, recent developments that have been undertaken and/or approved in the project area, the employment of mitigation measures, and the project's consistency with the MUC, an interim VRM Class IV has been established for the project area. The objective of this class is "to provide for management activities which require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic visual elements.

SECTION 2 - Approach to Impact Analysis Under the VRM System

The factors considered in determining impacts on visual resources included: (1) scenic quality of the project site and vicinity; (2) available visual access and visibility, and frequency and duration that the landscape is viewed; (3) viewing distance and degree to which project components would dominate the view of the observer; (4) resulting contrast of the project components or activities with existing landscape characteristics; (5) the extent to which project features or activities would block views of higher value landscape features; and (6) the level of public interest in the existing landscape characteristics and concern over potential changes.

An *adverse visual impact* occurs within public view when: (1) an action perceptibly changes existing features of the physical environment so that they no longer appear to be characteristic of the subject locality or region; (2) an action introduces new features to the physical environment that are perceptibly uncharacteristic of the region and/or locale; or (3) aesthetic features of the landscape become less visible (e.g., partially or totally blocked from view) or are removed. Changes that seem uncharacteristic are those that appear out of place, discordant, or distracting. The degree of the visual impact depends upon how noticeable the adverse change may be. The noticeability of a visual impact is a function of project features, context, and viewing conditions (angle of view, distance, primary viewing directions, and duration of view).

Impacts on visual resources within the study area could result from various activities including structure and line construction, substation construction, establishment of construction staging areas and access roads, and project operation or presence of the built facilities.

CONTRAST ANALYSIS METHODOLOGY

Under the BLM's VRM methodology, the proposed project and alternatives were analyzed for their effects on visual resources using an assessment of the visual contrast within the landscape created by components of the project. Impacts to the inventoried visual resource values and conformance with Interim VRM Class Objectives are evaluated through a contrast rating process described below. The degree to which the proposed action and alternatives adversely affect the visual quality of a landscape is directly related to the amount of visual contrast between the alternative and the existing landscape character. Visual Contrast Ratings were conducted using the BLM's VRM System manuals (BLM 1984, 1986a). The Visual Contrast Rating Forms are provided in Appendix G-4. Under the VRM System, the degree to which a project or activity affects the visual quality of a landscape depends on the visual contrast created between the project components and the major features, or predominant qualities, in the existing landscape. Visual contrast evaluates a project's consistency with the visual elements of form, line color, and texture already established in the viewshed. In a sense, visual contrast indirectly indicates a particular landscape's ability to absorb a project's components and location without resulting in an uncharacteristic appearance. Other elements that are considered in evaluating visual contrast include the degree of natural screening by vegetation and landforms; placement of structures relative to existing vegetation, landforms and other structures; distance from the point of observation; and relative size or scale of a project. Once the degree of anticipated contrast is determined (ranging from none to strong), a conclusion on the overall level of change is made (ranging from very low to high) and compared to the applicable VRM class objective for a determination of conformance with the Interim VRM Class objectives.

For the DHSP, the applicable Interim VRM Class is **VRM Class IV**. The management objective for VRM Class IV (as previously noted) is as follows:

- **VRM Class IV**. The objective is to provide for management activities, which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements in the predominant natural features of the characteristic landscape.

BLM's VRM Policy does not require VRM Classes to be used as a method to preclude all other resource development. However, it does require that visual values be considered and that those considerations be documented as part of the decision-making process, and that if resource development/extraction is approved, a reasonable attempt must be made to meet the VRM objectives for the area in question and to minimize the visual impacts of the proposal. Because the CDCA Plan does not have Resource Management Plan-approved VRM objectives, a land use plan amendment is not necessarily required to address instances of non-conformance. Nevertheless, the overall goal remains minimizing visual impacts through mitigation measures. In addition to the permanent visual contrast created in the landscape, the proposed action and alternatives are analyzed for adverse effects due to lighting and glare, visible dust plumes, as well as temporary construction-related disturbances.

VISUAL SIMULATIONS

To prepare the visual simulations for each KOP, appropriately scaled polygons were first constructed in Google Earth at each structure location. A Google Earth perspective view was then achieved to match a KOP existing view photograph. The perspective view image was then layered with the existing view image and the constructed polygons were used as guides for appropriately scaling and placing individual wind turbine images into the existing view photograph, which was then saved as the simulation image. A similar process was used for the access roads.

MITIGATION APPROACH

Mitigation for visual resources impacts resulting from energy infrastructure and similar types of industrial facilities typically focuses on methods to minimize the visibility of the resulting visual change either by screening the change from view or by blending the change with the background (by selective use of coloration and/or screening). By their very nature, transmission structures tend to be large and exposed, and thus, difficult to either hide from view or blend into the background. Also problematic is the grading associated with the solar facility construction, and construction of permanent access and structure spur roads and "temporary" cleared areas that become persistent in arid and semi-arid landscapes where vegetation recruitment and growth are slow. These features often cause unnatural and discordant demarcations in the vegetation landscape that increase the visual contrast of project activities.

However, in some cases there are techniques that can reduce the prominence of land scarring and vegetation changes though they may not reduce the impact. The following techniques were considered where appropriate for the proposed project and alternatives:

- Require revegetation and restoration efforts to mitigate the unnatural demarcation in vegetation landscapes caused by removal of or changes in the vegetation within the project area as a result of clearing and maintenance.
- Consider alternative low-impact construction techniques to minimize prominent land scarring visible to sensitive viewpoints.

For each of the visual impacts identified, the mitigation approaches discussed above were evaluated for applicability and likelihood of success. In almost all cases, the combination of existing landscape characteristics and structure prominence and visibility resulted in impacts that could not be mitigated. However, where mitigation opportunities were identified, they are discussed.

References

U.S. Department of the Interior, Bureau of Land Management (BLM). 1986. *Visual Resource Inventory Manual H-8410-1*.

_____. 1986. *Visual Resource Contrast Rating Manual 8431*.

_____. 1984. *Visual Resource Management Manual 8400.*

_____. 1980, as amended 1999. *California Desert Conservation Area Plan*.

TRUESCAPE

CONSULTING & VISUAL FACILITATION

Statement of Methodology of
Truescape Limited

On behalf of

enXco

Desert Harvest Solar Farm

August - 2012

1. TRUESCAPE CREDENTIALS

1.1 Truescape has over 16 years of experience working in the 3D Photo and Video Simulations industry. Truescape has completed a wide range of different visualisation projects from photo-simulations for simple projects to full computer generated 3D video simulations for complex projects. Truescape's client base spans many industry sectors such as solar, wind, transmission and generation across New Zealand, Australia, and the US.

1.2 Truescape adopts a team approach for project completion as each type and phase of a project calls for a different mix of specialised skill sets. This expertise spans many disciplines including photography, engineering, architecture, surveying, landscape architecture, 3D computer modelling, evidence preparation and presenting evidence as expert witnesses. All members of our staff have either formal qualifications or have undergone professional training and have direct experience working in each these specialised areas.

1.3 Truescape simulations have been produced as evidence in forums such as the New Zealand Environment and High Courts, Australia's Victorian Civil and Administrative Tribunal, the Supreme Court and the Connecticut Siting Council. Members of Truescape's staff have presented evidence as expert witnesses in these Courts, where our work has been subjected to cross-examination and accepted as evidence.

1.4 Truescape has assisted in providing survey controlled simulations for the following developments:

- 2003 – Meridian Energy, Te Apiti Farm, Council Hearing;
- 2004 – Meridian Energy, White Hill Farm, Council Hearing;
- 2004 – Southern Hydro, Dollar Wind Farm South Australia, Panel Hearing;
- 2005 – Genesis Energy, Awhitu Wind Farm, Environment Court;
- 2005 – Unison Energy, Hawkes Bay Wind Farm, Environment Court;
- 2006 – Meridian Energy, Project West Wind, Environment Court;
- 2006 – Acciona Energy, Wind Farm South Australia, Panel Hearing;
- 2007 – Invenergy, Moresville Wind Energy Park, New York; USA Permitting Hearing;

- 2008 – Bluewater Wind, Offshore Wind Farm, Maryland, USA; Permitting Hearing;

- 2008 – Bluewater Wind, Offshore Wind Farm, New Jersey, USA; Permitting Hearing

- 2008 – BP Alternative Energy – White Pines Project, Michigan, USA; Permitting

- 2008 - Meridian Energy, Project Mill Creek, Council Hearing

- 2008 – Meridian Energy, Project Hayes, Environment Court;

- 2009 – Meridian Energy; Project Central Wind; Environment Court

- 2010 – WestWind Energy, Australia, Permit Application;

- 2010 – Pacific Hydro; Australia, Panel Hearing;

- 2011 – AltaLink, Heartland Transmission Project; Alberta Utilities Commission (AUC) Hearing, Alberta Canada

2. SCOPE OF STATEMENT

2.1 enXco engaged Truescape in June 2012 to provide:

- Three animated time-lapse simulations from three pre-determined Key Observation Points (KOP) depicting how the proposed "Desert Harvest Solar Farm" would look under the climatic conditions that were experienced when capturing the photography. First Solar's neighbouring "Desert Sunlight Solar Farm" was modelled and shown in the simulations at its stage of completion.
- Truescape spent a considerable amount of time on site to capture photography for this project. The atmospheric conditions over several days however did not allow Truescape to capture photography of high enough clarity suitable to simulate potential glare of the solar farm from a third KOP at a distance of approx. 8 miles from the project. The timeframe did not allow Truescape to capture and prepare a third time-lapse simulation from this point to support the visual assessment. Truescape focussed on completing the two KOPs from approx. 4 miles and approx. 5 miles distance to the project (see KOP map on page 5).

2.2 The scope of Truescape's work does not extend to the assessment or interpretation of the simulations.

2.3 Page 4 provides validation of our methodology with post construction analysis of Project West Wind, a wind farm project in New Zealand.

2.4 We have set out the following in **Appendix A**

- Key Observation Point Locations; (Page 5)
- Deliverables; (Page 6)
- An overview of the animated Time-lapse Simulation; (Page 7)
- Methodology; (Pages 8 -12)
- Model Input Data used to create the simulations; (Pages 13-17)

3 SUMARY AND CONCLUSION

3.1 The Time-lapse Simulations have been created using a robust methodology. The time-lapses depict how the proposed project will be experienced during the course of an entire day and accurately reflect the correct sunlight and climatic conditions experienced at the time of photography.

VALIDATION OF THE TRUESCAPE METHODOLOGY

4.1 We have attached below some post construction analysis of the Project West Wind wind farm that compared a simulation against the completed project. This comparison demonstrates the accuracy of the TrueView methodology. In particular, it can be seen that the size and placement of the turbines in this simulation is identical to the wind farm that was constructed. It should be noted that the turbines in the simulation seem more obvious than the actual turbines in the photograph due to the atmospheric conditions experienced on the day the photograph was taken.

4.2 The simulation and photograph were produced 2 years and 7 days apart and both are taken at the same time of day so as to produce the same lighting and shadow conditions.

SIMULATION OF PROJECT WEST WIND PRE CONSTRUCTION (February 2008)

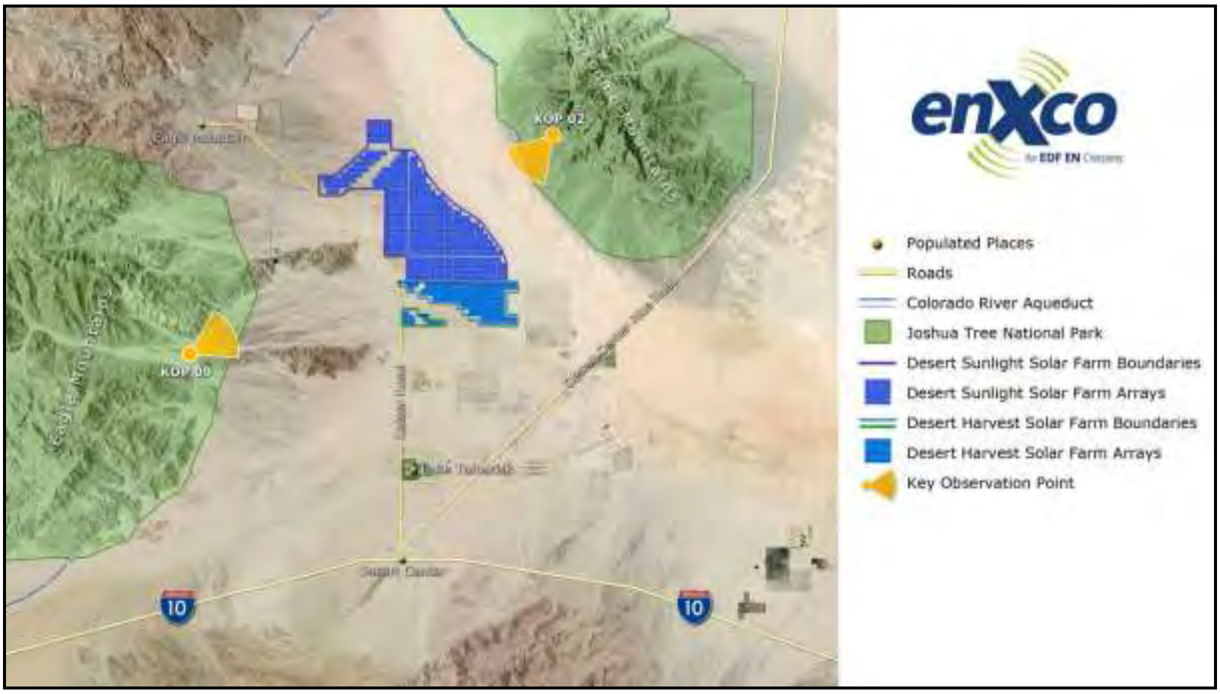
PHOTOGRAPH OF PROJECT WEST WIND POST CONSTRUCTION (February 2010)

4.3 The methodology by which the enXco "Desert Harvest Solar Farm" Time-lapse Simulations were created is based upon the same survey accurate technology that was used to create the simulation above.

APPENDIX A

KEY OBSERVATION POINT LOCATIONS

- Location map depicting key observation point (KOP) locations and orientation of view (orange cones) used for the animated time-lapse simulations.
- To provide overall project context, First Solar's "Desert Sunlight Solar Farm" is depicted as well.

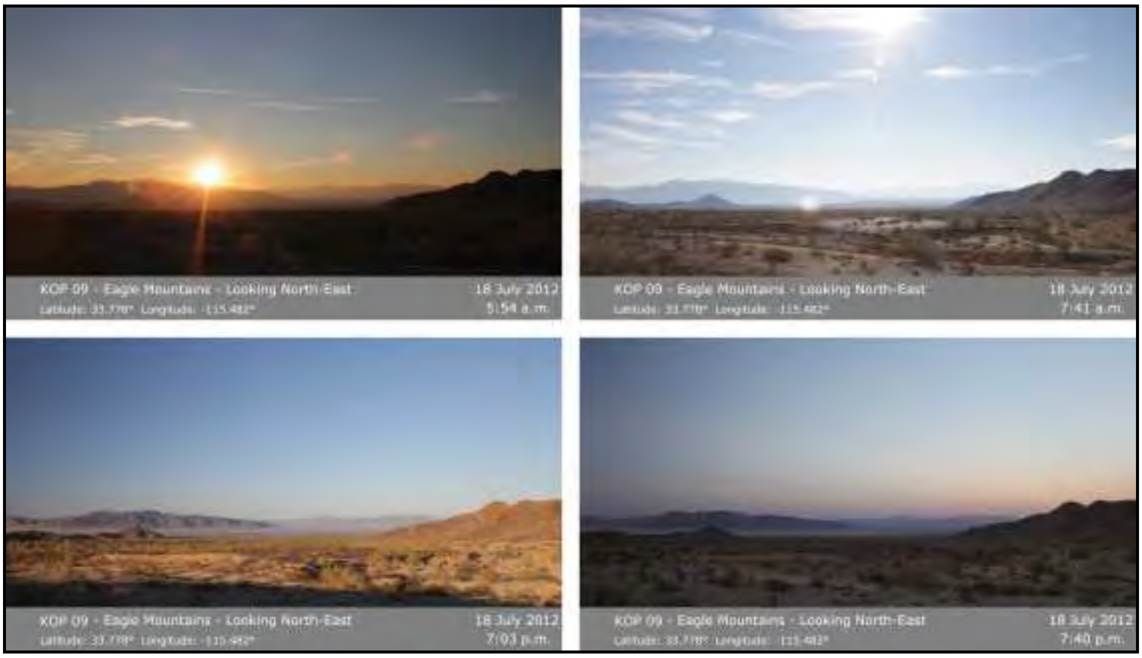


- KOP 02 – Coxcomb Mountains – looking South-West
- KOP 09 – Eagle Mountains – looking North-East

DELIVERABLES

Digital Windows-Media-Video (WMV) files of the animated time-lapse simulations were delivered for each of the Key Observation Points (KOP). The images below are still images from the final animated time-lapse simulations, each representing 4 different moments during the course of a day.

- KOP 02 – Coxcomb Mountains – looking South-West



- KOP 09 – Eagle Mountains – looking North-East

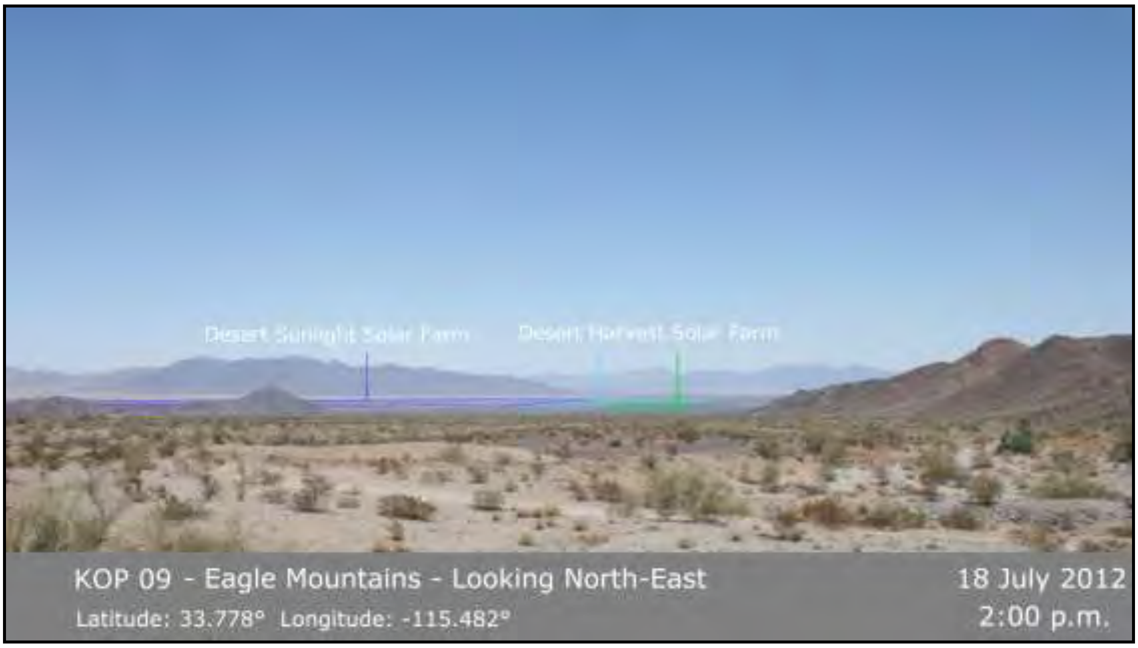
As outlined under paragraph 2.1 on page 3, a time-lapse simulation from a third KOP could not be completed due to time and weather constraints.

TIME-LAPSE SIMULATION

- A Time-lapse Simulation depicts how a proposed project will be experienced during the course of an entire day, and accurately reflects the exact sunlight and climatic conditions experienced at the time of photography.

- Capturing a photograph every 15 sec during the course of an entire day allows differing light and climatic conditions to be accurately communicated.

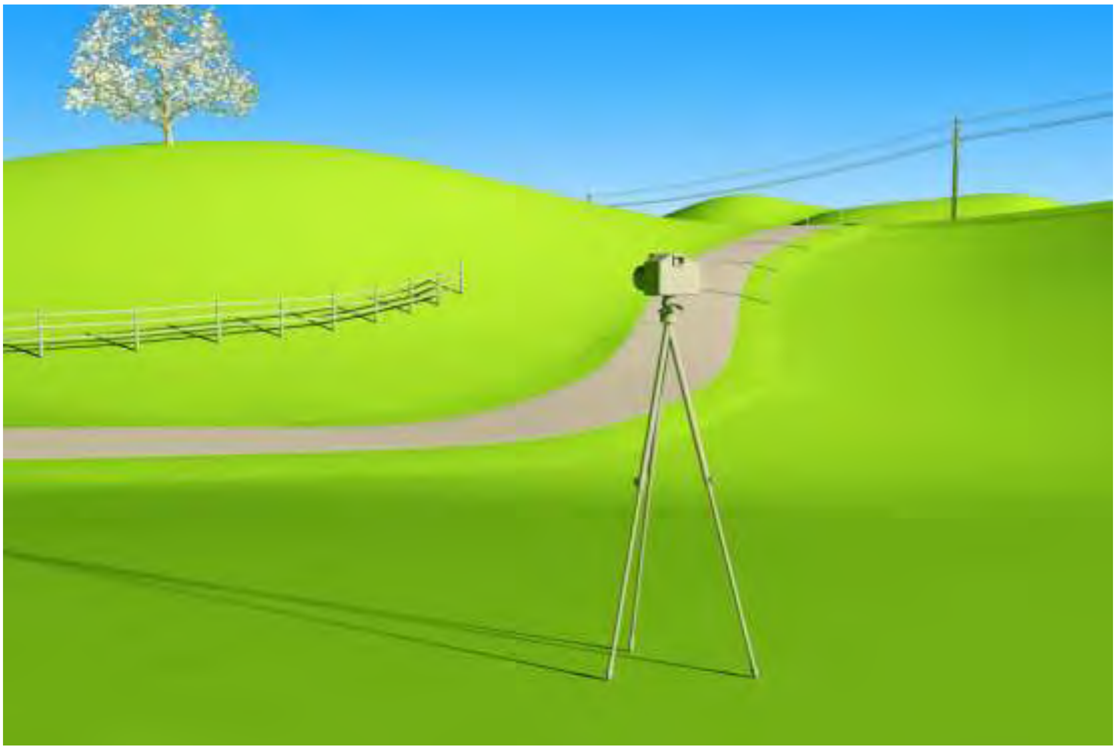
- First Solar's neighbouring "Desert Sunlight Solar Farm" – currently under construction – is simulated at its state of completion.



- An occasional colour overlay of project boundaries and labelling allows distinguishing between the two projects depicted.

METHODOLOGY

The Site Visit

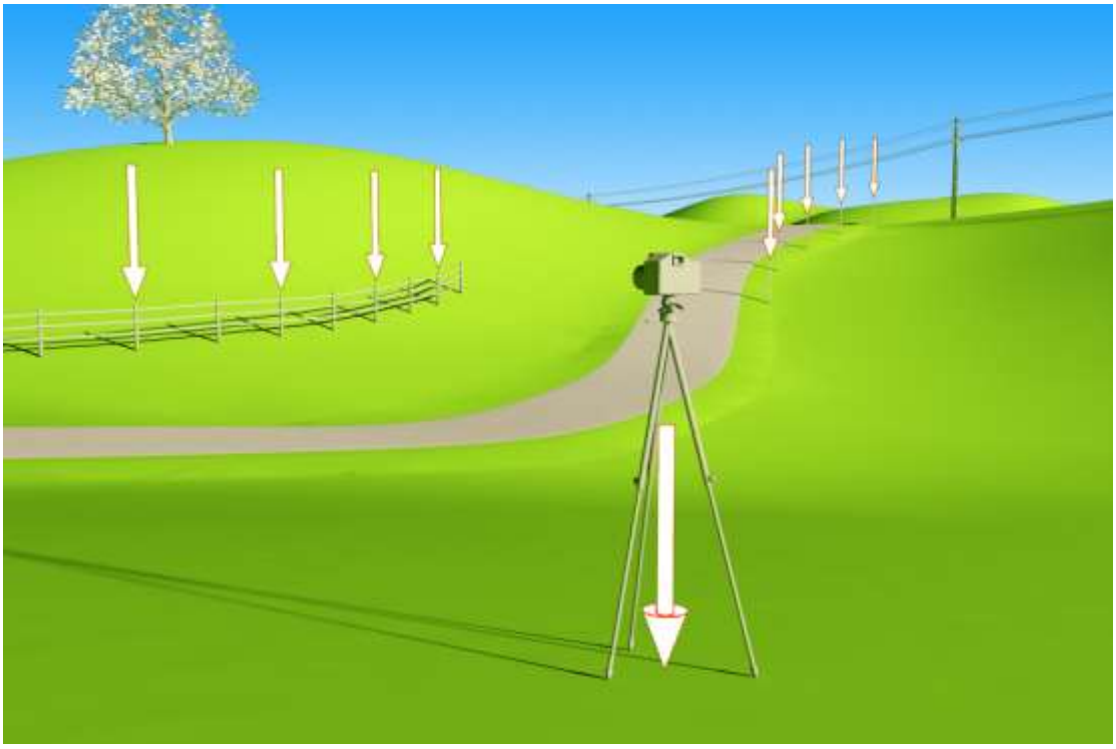


- The site visit is undertaken to capture the necessary photographs and ground mark the photo point position and identify additional reference points to enable the surveyor to survey fix the exact location of the camera.

- A digital SLR 1:1 21 mega pixel camera is used to take the photography. This camera produces photographs at a resolution and clarity as good as current technology will allow when generating simulations.

METHODOLOGY

Capturing the surveyed reference points

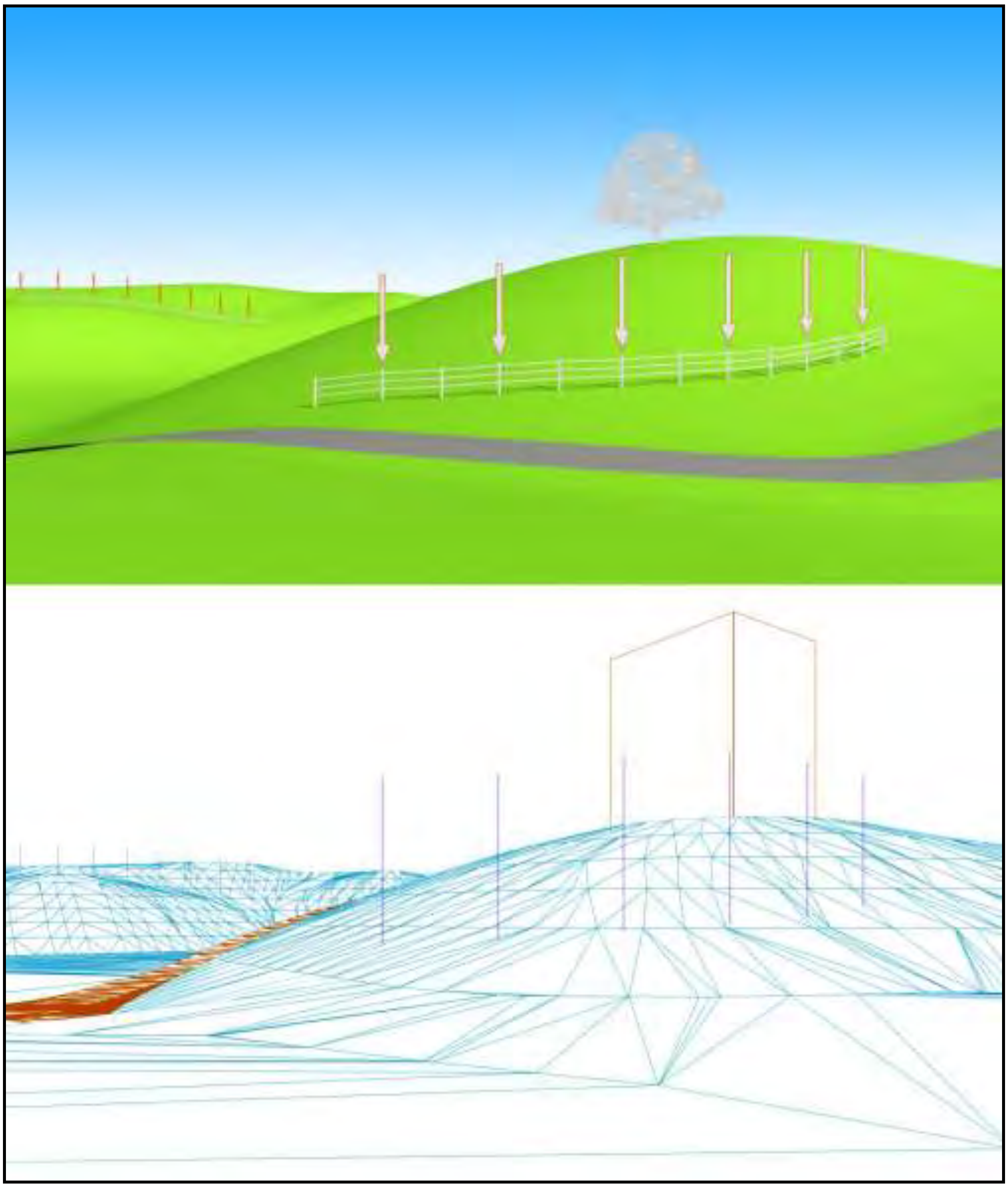


- To accurately create an animated time-lapse video simulation the exact position of the camera is survey fixed by a registered surveyor.

- Additional reference points are identified during the site visit so that the 3D model can be accurately placed into the photo stream. These reference points include things like fences, vegetation, or temporary markers placed in the scene. The surveyor is directed to each of these points.

METHODOLOGY

Aligning the surveyed reference points



- The next step is to construct the 3D computer model. Using Autodesk® 3ds Max® 3D computer simulation software the survey fixed photo and reference points are imported into the 3D model. A "computer camera" is created to simulate the camera that captured the original photographs, including matching the focal length. The simulated "computer camera" is then positioned at the same survey coordinates as the physical observation point position.

- The photographs are then incorporated into the computer model. This is done by correctly aligning the "computer camera" to match the surveyed reference points to the reference objects, and to the terrain if required.

METHODOLOGY

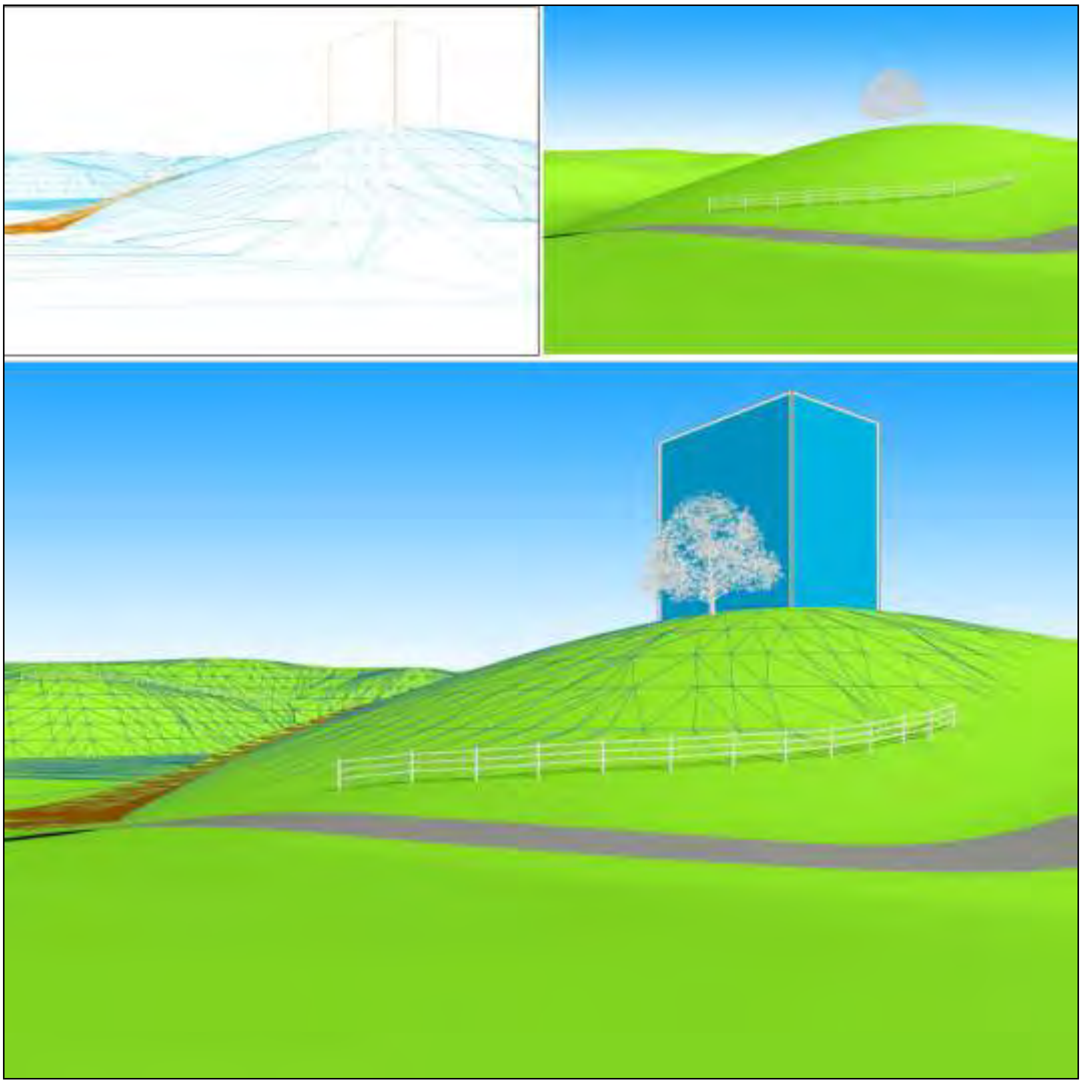
Building the proposed project in 3D

- The proposed project is then modelled in 3D in accordance with all dimensions, site layouts, colours and textures.

- Elevated close-up view of 3D-model of the High Profile 15 foot tracking solar panels, power converter station unit and Gen-Tie transmission line structures.

METHODOLOGY

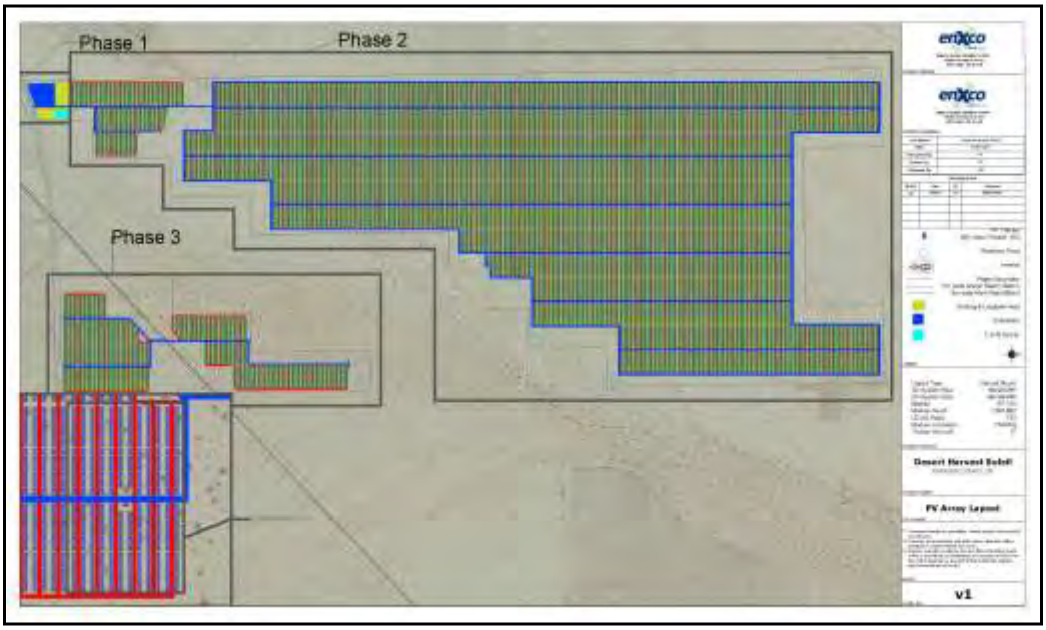
Building the proposed project in 3D



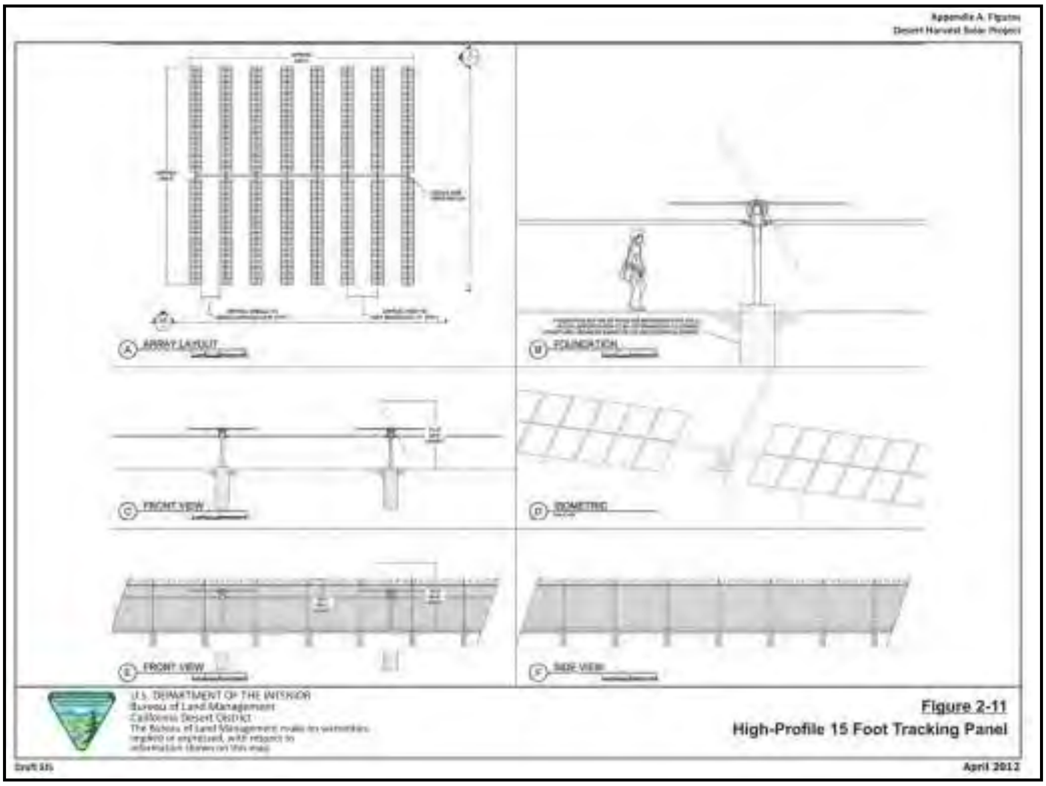
- The 3D terrain model of the site has been generated using the land contour data. The proposed project components have now been modelled in 3D and are imported and positioned accurately into the scene.
- The simulation software allows the sun to be simulated for the precise period of time the original photography was captured for. This ensures the lighting of the solar panels as well as the shadows they cast are an accurate depiction of how the proposed "Desert Harvest Solar Farm" would appear in the photo-stream during the course of that day and reflecting the same climatic conditions as those experienced at the time the photographs were taken.
- In order to correctly place existing objects that are in front of the 3D model of the development, these foreground objects are overlaid from the original photographs onto the computer generated image using AfterEffects software.

MODEL INPUT DATA

All data including solar panel layout, dimensions and array placement as well as Gen-Tie transmission structure design were provided by enXco.

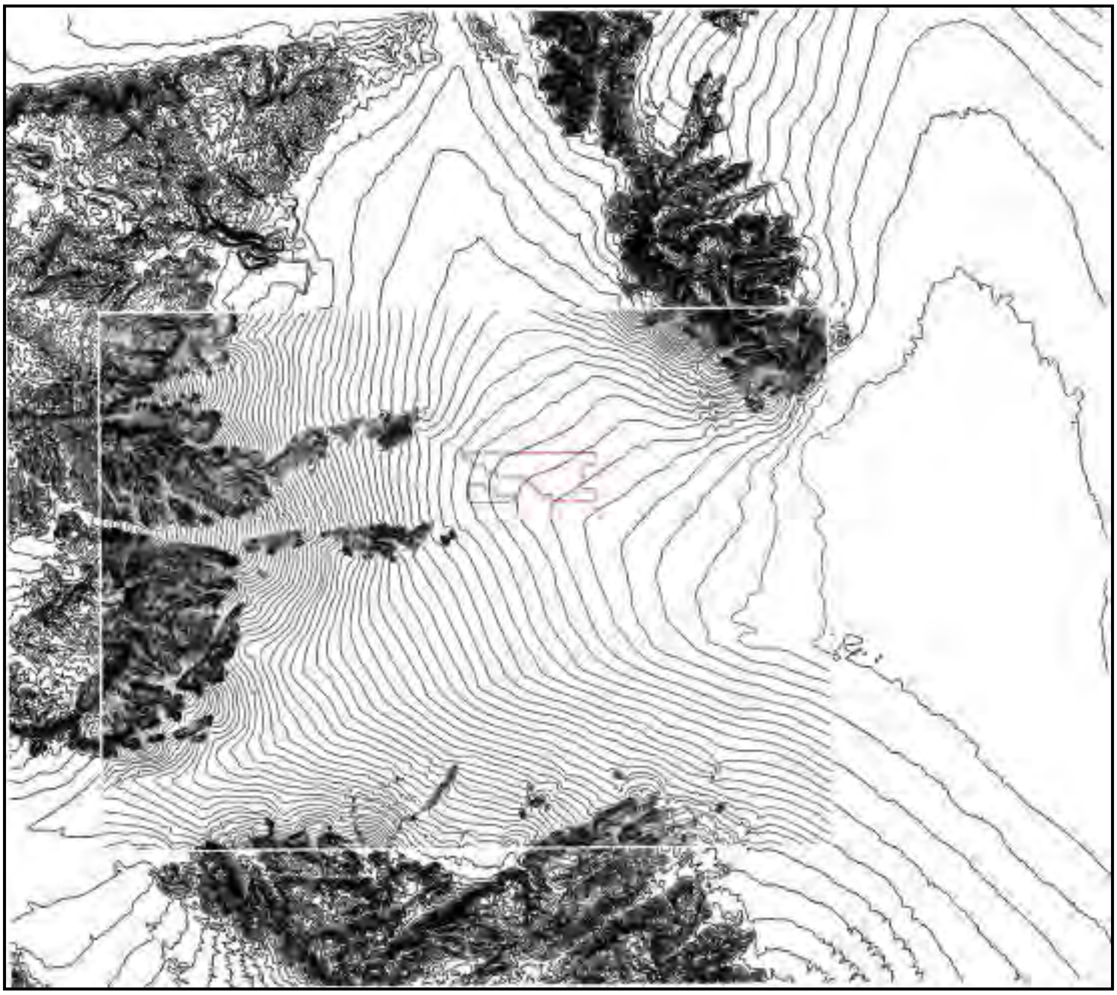


- Above screenshot depicts AutoCAD drawing specifying solar array layout, location of substation, O&M facilities as well as project boundaries.



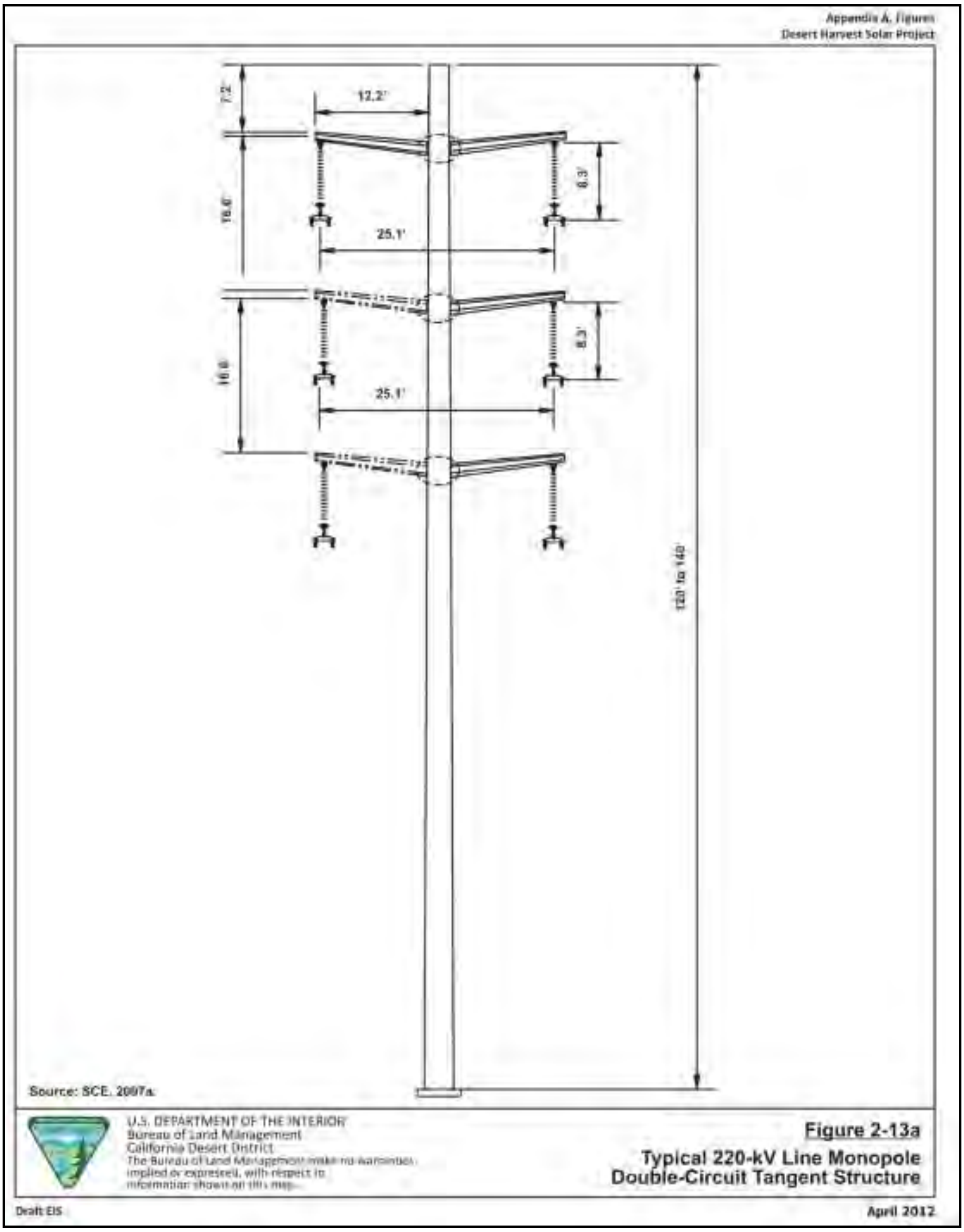
- Above screenshot depicts dimensions and spacing of the high-Profile 15 foot tracking panels as well as details of the security fence.

MODEL INPUT DATA



- Above screenshot depicts terrain data sourced from GIS data bases.
  The red line depicts the project boundaries of the "Desert Harvest Solar Farm" project.

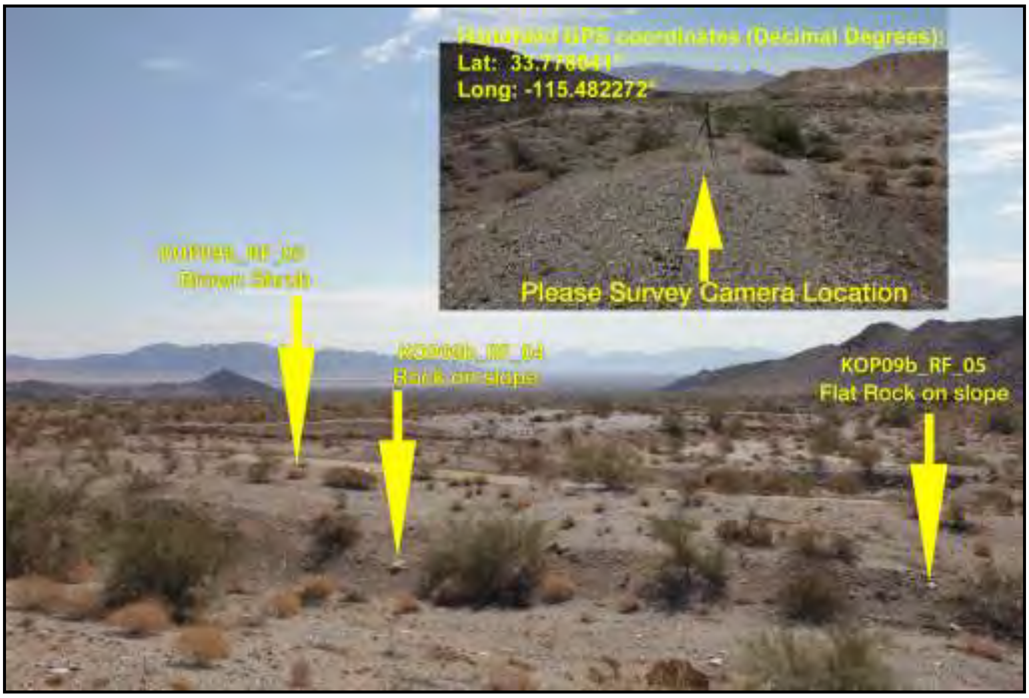
MODEL INPUT DATA



- Above drawing depicts type and typical height of the proposed Gen-Tie transmission structures.

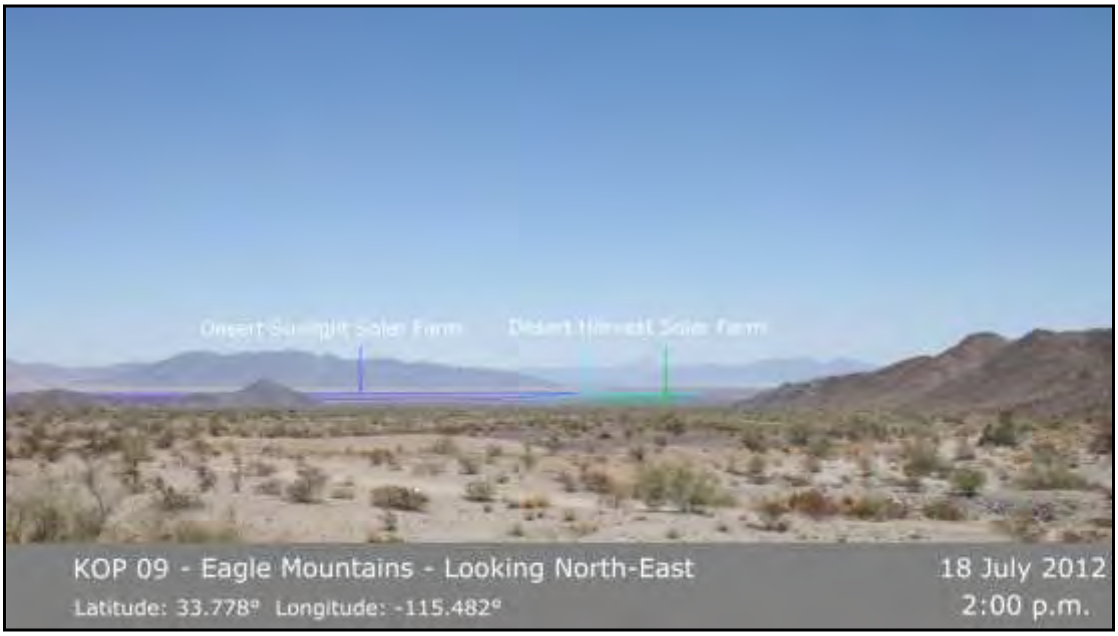
MODEL INPUT DATA

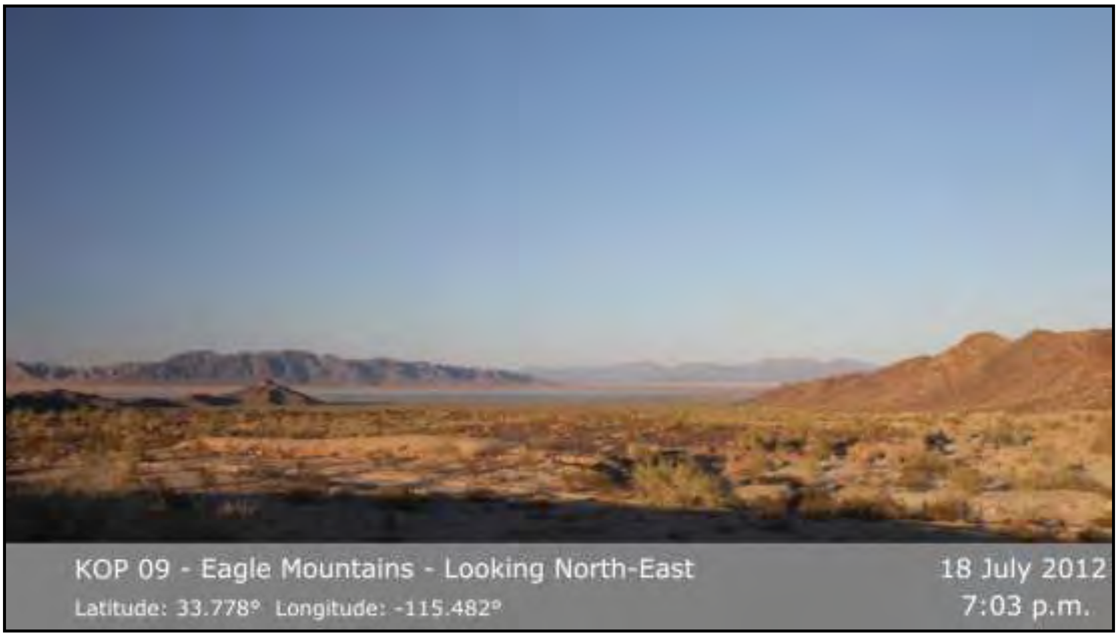
The images below represent alignment of the digital terrain (depicted by red overlay) and 3D-model to the real world photography.
Camera locations including individual reference points where surveyed by: Section Thirty Seven Consultants.



- Using "KOP 09 - Eagle Mountains – looking North-East" as an example these images show reference points depicted by coloured lines which have been requested (yellow arrows), survey fixed (bottom of black cylinders) and were used to accurately position the 3D model of the proposed "Desert Harvest Solar Farm" into the photographs.

Two representative still images of the final animated time-lapse simulation for this Key Observation Point are depicted below.





Appendix G.2

Summary of Key Observation Point Analyses

ALTERNATIVE 4 - PROPOSED SOLAR PROJECT										
VIEWPOINT		**BLM - EXISTING VISUAL SETTING**					**BLM - VISUAL CONTRAST ANALYSIS**		**CEQA IMPACT SIGNIFICANCE**	
Key Observation Point (KOP)	**Description**	**Scenic Quality Classification**	**Viewer Sensitivity**	**VRM Class** Status	**VRM Class** Rating	**VRM Class** Management Objective	**Level of Change** (See Appendix G4 Contrast Rating Worksheets)	**VRM Consistency**	**Before Mitigation** / **After Mitigation**	**Mitigation**
KOP 1 **Joshua Tree Wilderness – Eagle Mountains** **Proposed Project** **Figures 4.19-1A / 1B**	View to the south from a low ridge at the northeast extent of the Eagle Mountains, at the north end of Chuckwalla Valley.	**Class C** This panoramic vista encompasses the open expanse of the northern Chuckwalla Valley, backdropped by the Chuckwalla Mountains to the south and the Eagle Mountains to the west. This area includes a foreground to middleground flat desert landscape that supports a sparse and irregular, to more uniform at distance, distribution of short grasses and shrubs of subdued color consisting of tans, browns, and muted greens. Although the rugged and visually interesting landforms of the Eagle and more distant Chuckwalla Mountains provide a backdrop of visual interest, the desert basin landscape is relatively non-descript and common to much of the Chuckwalla Valley.	**High** These lands are within the California Desert Conservation Area and are within the foreground/ middleground viewsheds of Kaiser Road, SR 177 (Rice Road), Desert Lily Sanctuary ACEC, and Joshua Tree Wilderness in both the Eagle and Coxcomb Mountains. This location is near an access point to JNP.	**Interim**	**IV**	To provide for management activities that require major modification of the landscape character. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic landscape elements.	**Low** The Proposed project would result in the introduction of barely discernible built structures that, at an approximately eight-mile viewing distance, would appear as a low, narrow, light-colored, horizontal line along the valley floor (solar farm), and faintly visible, vertical structural elements. The resulting structural visual contrast for form, line, color, and texture would be weak (relative to the natural character of the existing landscape). Also, view impairment of the valley floor or other background landforms would be minimal.	**Consistent** The low level of change would be allowed under the VRM Class IV management objective.	**BEFORE:** **Less than Significant (Class III)** **AFTER:** **Same**	**VR-1 through VR-6**
KOP 2 **Joshua Tree Wilderness – Coxcomb Mountains** **Proposed Project** **Figures 4.19-2A / 2B**	View to the southwest from an elevated vantage point along the western flank of the Coxcomb Mountains, northeast of the project site.	**Class C** This panoramic vista and elevated overlook of the northern Chuckwalla Valley also encompasses the Chuckwalla Mountains to the south and the Eagle Mountains to the west. This elevated view captures the variety of colors that are manifested in the soils, rocks, vegetation, and erosional patterns of the Chuckwalla Valley floor. The angular to low horizontal and rugged forms of the background Chuckwalla and Eagle Mountains provide features of additional visual interest. While some localized areas of ground disturbance are noticeable at this middleground viewing distance, they are not prominent features and the landscape is predominantly natural in appearance, though relatively non-descript and common to much of the Chuckwalla Valley.	**High** These lands are within the California Desert Conservation Area and are within the foreground/ middleground viewsheds of Kaiser Road, SR 177 (Rice Road), Desert Lily Sanctuary ACEC, and Joshua Tree Wilderness in both the Eagle and Coxcomb Mountains.	**Interim**	**IV**	To provide for management activities that require major modification of the landscape character. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic landscape elements.	**Moderate to High** The Proposed project would result in the introduction of a large-scale complex of built structures and graded surfaces forming a spatially and visually prominent series of geometric patterns on the valley floor, that would contrast with the predominantly natural appearance of the northern Chuckwalla Valley landscape and background Chuckwalla and Eagle Mountains. The color and reflective characteristics of the panel support structures would contribute to the noticeable contrast with existing earthtone colors.	**Consistent** The moderate to high level of change would be allowed under the VRM Class IV management objective.	**BEFORE:** **Significant (Class I)** **AFTER:** **Same**	**VR-1 through VR-6**

ALTERNATIVE 4 - PROPOSED SOLAR PROJECT (continued)

VIEWPOINT		BLM - EXISTING VISUAL SETTING					BLM - VISUAL CONTRAST ANALYSIS		CEQA IMPACT SIGNIFICANCE	
Key Observation Point (KOP)	Description	Scenic Quality Classification	Viewer Sensitivity	VRM Class: Status	VRM Class: Rating	VRM Class: Management Objective	Level of Change (See Appendix G4 Contrast Rating Worksheets)	VRM Consistency	Before Mitigation / After Mitigation	Mitigation
KOP 3 **Kaiser Road in the Immediate Project Vicinity** **Proposed Project** **Figures 4.19-3A / 3B**	View to the east from Kaiser Road, in the immediate vicinity of the project site.	**Class C** This view encompasses the open expanse of a central portion of the Chuckwalla Valley, backdropped by the southern extent of the Coxcomb Mountains and the more distant Palen Mountains. This area includes a foreground to middleground flat desert landscape that supports a sparse and irregular, to more uniform at distance, distribution of short grasses and shrubs of subdued color consisting of tans, browns, and muted greens. Although the rugged and visually interesting landforms of the nearby Coxcomb Mountains and more distant Palen Mountains provide a backdrop of visual interest, the desert basin landscape is relatively non-descript and common to much of the Chuckwalla Valley.	**High** These lands are within the California Desert Conservation Area and are within the foreground/ middleground viewsheds of Kaiser Road, SR 177 (Rice Road), Desert Lily Sanctuary ACEC, and Joshua Tree Wilderness in both the Eagle and Coxcomb Mountains.	**Interim**	**IV**	To provide for management activities that require major modification of the landscape character. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic landscape elements.	**Moderate to High** The Proposed Action would result in the introduction of visually prominent built structures into a landscape generally lacking similar built features of industrial or technological character. The solar farm would appear as prominent horizontal and geometric features with prominent horizontal lines associated with specific panel arrays, development units, and demarcations from graded surfaces. The resulting form and line contrast of the solar panels would be moderate to strong (relative to the natural character of the existing landscape). The color and texture of the solar panels would result in moderate degrees of visual contrast. Also, the solar panels would cause partial view blockage of the Chuckwalla Valley floor.	**Consistent** The moderate-to-high level of change would be allowed under the VRM Class IV management objective.	**BEFORE:** **Significant (Class II)** **AFTER:** **Less than Significant**	**VR-1 through VR-6**
KOP 4 **Desert Lily Sanctuary ACEC** **Proposed Project** **Figures 4.19-4A / 4B**	View to the west from the Desert Lily Sanctuary ACEC, just east of SR 177.	**Class C** This view encompasses a central portion of the Chuckwalla Valley, backdropped by the Eagle Mountains to the west. This area includes a foreground to middleground flat desert landscape that supports a sparse and irregular, to more uniform at distance, distribution of short grasses and shrubs of subdued color consisting of tans, browns, and greens. Also visible is a wood-pole utility line. Although the rugged and visually interesting landforms of the Eagle Mountains provide a backdrop of visual interest, the desert basin landscape is relatively non-descript and common to much of the Chuckwalla Valley.	**High** These lands are within the California Desert Conservation Area and are within the foreground/ middleground viewsheds of Kaiser Road, SR 177 (Rice Road), Desert Lily Sanctuary ACEC, and Joshua Tree Wilderness in both the Eagle and Coxcomb Mountains.	**Interim**	**IV**	To provide for management activities that require major modification of the landscape character. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic landscape elements.	**Very Low** The Proposed Action would result in the introduction of barely discernible built structures that, at an approximately 5.5 mile viewing distance, and the presence of substantial intervening vegetation, would be barely noticeable along the valley floor. Neither the solar farm nor the transmission line structures would be perceived as prominent features in the landscape, and view impairment of the valley floor or other background landforms would be minimal. The resulting structural form and line contrast would be weak, and there would be no discernible color or texture contrast, when viewed from the Desert Lily Sanctuary ACEC.	**Consistent** The very low level of change would be allowed under the VRM Class IV management objective.	**BEFORE:** **Less than Significant (Class III)** **AFTER:** **Same**	**VR-1 through VR-6**

APPENDIX G-2
DESERT HARVEST SOLAR FARM PROJECT EIS/CDCA PLAN AMENDMENT: VISUAL RESOURCES – SUMMARY OF KEY OBSERVATION POINT ANALYSES

ALTERNATIVE 7 – HIGH PROFILE REDUCED FOOTPRINT

VIEWPOINT		BLM - EXISTING VISUAL SETTING					BLM - VISUAL CONTRAST ANALYSIS		CEQA IMPACT SIGNIFICANCE	
Key Observation Point (KOP)	Description	Scenic Quality Classification	Viewer Sensitivity	VRM Class: Status	VRM Class: Rating	VRM Class: Management Objective	Level of Change (See Appendix G4 Contrast Rating Worksheets)	VRM Consistency	Before Mitigation / After Mitigation	Mitigation
KOP 1A **Joshua Tree Wilderness – Eagle Mountains** **Alternative 7 High-Profile Solar Project** **Figures 4.19-1A / 1C**	View to the south from a low ridge at the northeast extent of the Eagle Mountains, at the north end of Chuckwalla Valley.	**Class C** This panoramic vista encompasses the open expanse of the northern Chuckwalla Valley, backdropped by the Chuckwalla Mountains to the south and the Eagle Mountains to the west. This area includes a foreground to middleground flat desert landscape that supports a sparse and irregular, to more uniform at distance, distribution of short grasses and shrubs of subdued color consisting of tans, browns, and muted greens. Although the rugged and visually interesting landforms of the Eagle and more distant Chuckwalla Mountains provide a backdrop of visual interest, the desert basin landscape is relatively non-descript and common to much of the Chuckwalla Valley.	**High** These lands are within the California Desert Conservation Area and are within the foreground/ middleground viewsheds of Kaiser Road, SR 177 (Rice Road), Desert Lily Sanctuary ACEC, and Joshua Tree Wilderness in both the Eagle and Coxcomb Mountains. This location is near an access point to JTNP.	**Interim**	**IV**	To provide for management activities that require major modification of the landscape character. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic landscape elements.	**Low** Alternative 7 would result in the introduction of a noticeable horizontal, built feature, which, at an approximately eight-mile viewing distance, would appear as a low, narrow, variably-colored, horizontal line along the valley floor (solar farm), and faintly visible, vertical structural elements (gen-tie line). The resulting structural visual contrast for form and texture would be weak. For line and color, the resulting visual contrast would be weak to moderate (relative to the natural character of the existing landscape). Also, view impairment of the valley floor or other background landforms would be minimal.	**Consistent** The low level of change would be allowed under the VRM Class IV management objective.	**BEFORE:** **Less than Significant (Class III)** **AFTER:** **Same**	**VR-1 through VR-6**
KOP 3A **Kaiser Road in the Immediate Project Vicinity** **Alternative 7 High-Profile Solar Project** **Figures 4.19-3C / 3D**	View to the northeast from Kaiser Road, in the immediate vicinity of the project site.	**Class C** This view encompasses the open expanse of a central portion of the Chuckwalla Valley, backdropped by the Coxcomb Mountains. This area includes a foreground to middleground flat desert landscape that supports a sparse and irregular, to more uniform at distance, distribution of short grasses and shrubs of subdued color consisting of tans, browns, and muted greens. Although the rugged and visually interesting landforms of the nearby Coxcomb Mountains and more distant Palen Mountains provide a backdrop of visual interest, the desert basin landscape is relatively non-descript and common to much of the Chuckwalla Valley.	**High** These lands are within the California Desert Conservation Area and are within the foreground/ middleground viewsheds of Kaiser Road, SR 177 (Rice Road), Desert Lily Sanctuary ACEC, and Joshua Tree Wilderness in both the Eagle and Coxcomb Mountains.	**Interim**	**IV**	To provide for management activities, that require major modification of the landscape character. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic landscape elements.	**High** Alternative 7 would result in the introduction of visually prominent built structures into a landscape generally lacking similar built features of industrial or technological character. The solar farm would appear as prominent horizontal and geometric features with prominent horizontal lines associated with specific panel arrays, development units, and demarcations from graded surfaces. The resulting form and color contrasts of the solar panels would be moderate to strong (relative to the natural character of the existing landscape). The line contrast of the solar panels would be strong and the texture contrast would be moderate. Also, the solar panels would cause partial view blockage of the Chuckwalla Valley floor and background Coxcomb and Palen Mountains.	**Consistent** The high level of change would be allowed under the VRM Class IV management objective.	**BEFORE:** **Significant (Class I)** **AFTER:** **Same**	**VR-1 through VR-6**

ALTERNATIVE 7 – HIGH PROFILE REDUCED FOOTPRINT (continued)										
VIEWPOINT		BLM - EXISTING VISUAL SETTING					BLM - VISUAL CONTRAST ANALYSIS		CEQA IMPACT SIGNIFICANCE	
Key Observation Point (KOP)	Description	Scenic Quality Classification	Viewer Sensitivity	VRM Class			Level of Change (See Appendix G4 Contrast Rating Worksheets)	VRM Consistency	Before Mitigation / After Mitigation	Mitigation
				Status	Rating	Management Objective				
KOP 8A **Westbound I-10** **Alternative 7 High-Profile Solar Project** **Figures 4.19-8C / 8D**	View to the northwest from westbound I-10, north of the proposed Red Bluff Substation site, approximately 5.75 miles east of Desert Center, and approximately 0.2 mile east of the Alternative E Gen-Tie route span of I-10.	**Class C** This view to the north captures a central portion of the northern Chuckwalla Valley. The open expanse of the valley floor includes a foreground to middleground flat desert landscape that is generally natural appearing and supports a sparse and irregular, to more uniform at distance, distribution of short grasses and shrubs of subdued color consisting of muted yellows, tans, browns, and greens. Although the rugged and visually interesting landforms of the Eagle and Coxcomb Mountains provide a backdrop of visual interest, the desert basin landscape is relatively non-descript and common to much of the Chuckwalla Valley.	**High** These lands are within the California Desert Conservation Area and are within the foreground/ middleground viewsheds of I-10, SR 177 (Rice Road), the Desert Lily Sanctuary ACEC, the Alligator Rock ACEC, and the Chuckwalla Mountains Wilderness.	**Interim**	**IV**	To provide for management activities that require major modification of the landscape character. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic landscape elements.	**Moderate to High** This Alternative would result in the introduction of numerous visually noticeable to prominent built structures into a landscape generally lacking similar built features of industrial or technological character. The solar array, tubular steel poles, and curvilinear conductors would result in moderate-to-strong levels of form and line contrast relative to the natural character of the existing landscape. Color contrast would be moderate (notably the variable colors of the solar array depending on time of day, orientation of the tracking panels, and characteristics of the reflected sky). Texture contrast would be weak. Also, the solar array and transmission line would cause noticeable view blockage of the background Chuckwalla Valley floor and Eagle and Coxcomb Mountains.	**Consistent** The moderate-to-high level of change would be allowed under the VRM Class IV management objective.	**BEFORE:** **Significant (Class I)** **AFTER:** **Same**	**VR-1 through VR-6**
ALTERNATIVES B AND C GEN-TIE ROUTES										
KOP 5 **Northbound Kaiser Road Near Lake Tamarisk** **Alternative B and C Gen-Tie Routes** **Figures 4.19-5A / 5B**	View to the north-northwest from northbound Kaiser Road, near the community of Lake Tamarisk.	**Class C** This view toward the open expanse of Chuckwalla Valley west of Kaiser Road and the Eagle Mountains beyond, is partially obscured by roadside vegetation. This area includes a foreground to middleground flat desert landscape that supports a sparse and irregular, to more uniform at distance, distribution of short grasses and shrubs of subdued color consisting of muted yellows, tans, browns, and greens. Although the rugged and visually interesting landforms of the Eagle Mountains provide a backdrop of visual interest, the desert basin landscape is relatively non-descript and common to much of the Chuckwalla Valley.	**High** These lands are within the California Desert Conservation Area and are within the foreground/ middleground viewsheds of I-10, Kaiser Road, SR 177 (Rice Road), Alligator Rock ACEC, and Joshua Tree Wilderness in the Eagle Mountains.	**Interim**	**IV**	To provide for management activities that require major modification of the landscape character. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic landscape elements.	**High** This Alternative would result in the introduction of visually prominent built structures into a landscape generally lacking similar built features of industrial or technological character. The tubular steel poles and curvilinear conductors would result in strong levels of form and line contrast relative to the natural character of the existing landscape. Color contrast would be moderate and texture contrast would be weak to moderate. Also, the transmission line would cause substantial view blockage of the background Eagle Mountains.	**Consistent** The high level of change would be allowed under the VRM Class IV management objective.	**BEFORE:** **Significant (Class I)** **AFTER:** **Same**	**VR-3 and VR-4**

<table>
<tr><th colspan="11">ALTERNATIVE D GEN-TIE ROUTE</th></tr>
<tr><th colspan="2">VIEWPOINT</th><th colspan="5">BLM – EXISTING VISUAL SETTING</th><th colspan="2">BLM - VISUAL CONTRAST ANALYSIS</th><th colspan="2">CEQA IMPACT SIGNIFICANCE</th></tr>
<tr><th rowspan="2">Key Observation Point (KOP)</th><th rowspan="2">Description</th><th rowspan="2">Scenic Quality Classification</th><th rowspan="2">Viewer Sensitivity</th><th colspan="3">VRM Class</th><th rowspan="2">Level of Change
(See Appendix G4 Contrast Rating Worksheets)</th><th rowspan="2">VRM Consistency</th><th rowspan="2">Before Mitigation
After Mitigation</th><th rowspan="2">Mitigation</th></tr>
<tr><th>Status</th><th>Rating</th><th>Management Objective</th></tr>
<tr><td>KOP 6
Eastbound I-10 East of Desert Center

Alternative D Gen-Tie Route

Figures 4.19-6A / 6B</td><td>View to the northeast from eastbound I-10, east of Desert Center and approximately 0.8 mile west of the Alternative D Gen-Tie route span of I-10.</td><td>Class C
This view toward the open expanse of Chuckwalla Valley north of I-10, includes a foreground to middleground flat desert landscape that supports a sparse and irregular, to more uniform at distance, distribution of short grasses and shrubs of subdued color consisting of muted yellows, tans, browns, and greens. Although the rugged and visually interesting landforms of the Palen Mountains provide a backdrop of visual interest, the desert basin landscape is relatively non-descript and common to much of the Chuckwalla Valley.</td><td>High
These lands are within the California Desert Conservation Area and are within the foreground/ middleground viewsheds of I-10, Kaiser Road, SR 177 (Rice Road), Alligator Rock ACEC, and Chuckwalla Mountains Wilderness.</td><td>Interim</td><td>IV</td><td>To provide for management activities that require major modification of the landscape character. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic landscape elements.</td><td>High
This Alternative would result in the introduction of visually prominent built structures into a landscape generally lacking similar built features of industrial or technological character. The tubular steel poles and curvilinear conductors would result in strong levels of form and line contrast relative to the natural character of the existing landscape. Color and texture contrasts would be weak to moderate. Also, the transmission line would cause substantial view blockage of the background Palen Mountains.</td><td>Consistent
The high level of change would be allowed under the VRM Class IV management objective.</td><td>BEFORE:
Significant (Class I)
AFTER:
Same</td><td>VR-3 and VR-4</td></tr>
<tr><th colspan="11">ALTERNATIVE E GEN-TIE ROUTE</th></tr>
<tr><td>KOP 7
Northbound SR 177

Alternative E Gen-Tie Route

Figures 4.19-7A / 7B</td><td>View to the northeast from northbound SR 177, approximately 0.3 mile southwest of the Alternative E Gen-Tie route span of SR 177.</td><td>Class C
This view toward the Alternative E Gen-Tie route, SR 177 span location, captures a central portion of the northern Chuckwalla Valley where it is bisected by SR 177. The open expanse of valley floor is partially obscured by roadside vegetation. This area includes a foreground to middleground flat desert landscape that supports a sparse and irregular, to more uniform at distance, distribution of short grasses and shrubs of subdued color consisting of muted yellows, tans, browns, and greens. Although the rugged and visually interesting landforms of the Coxcomb and more distant Palen Mountains provide a backdrop of visual interest, the desert basin landscape is relatively non-descript and common to much of the Chuckwalla Valley.</td><td>High
These lands are within the California Desert Conservation Area and are within the foreground/ middleground viewsheds of I-10, Kaiser Road, SR 177 (Rice Road), and Joshua Tree Wilderness in the Coxcomb Mountains.</td><td>Interim</td><td>IV</td><td>To provide for management activities that require major modification of the landscape character. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic landscape elements.</td><td>Moderate to High
This Alternative would result in the introduction of visually prominent built structures into a landscape generally lacking structures of similar scale and industrial or technological character. The associated moderate to strong visual contrast of the tubular steel poles and curvilinear conductors is somewhat moderated by the linear forms and vertical lines of an existing wood-pole utility line adjacent to SR 177. Color contrast would be moderate and texture contrast would be weak to moderate. Also, the transmission line would cause considerable view blockage of the background Coxcomb and Palen Mountains.</td><td>Consistent
The moderate-to-high level of change would be allowed under the VRM Class IV management objective.</td><td>BEFORE:
Significant (Class I)
AFTER:
Same</td><td>VR-3 and VR-4</td></tr>
</table>

ALTERNATIVE E GEN-TIE ROUTE (continued)										
VIEWPOINT		BLM - EXISTING VISUAL SETTING					BLM - VISUAL CONTRAST ANALYSIS		CEQA IMPACT SIGNIFICANCE	
Key Observation Point (KOP)	Description	Scenic Quality Classification	Viewer Sensitivity	VRM Class			Level of Change (See Appendix G4 Contrast Rating Worksheets)	VRM Consistency	Before Mitigation / After Mitigation	Mitigation
				Status	Rating	Management Objective				
KOP 8 **Westbound I-10** **Alternative E Gen-Tie Route** **Figures 4.19-8A / 8B**	View to the north from westbound I-10, north of the proposed Red Bluff Substation site, approximately 5.75 miles east of Desert Center, and approximately 0.2 mile east of the Alternative E Gen-Tie route span of I-10.	**Class C** This view to the north captures a central portion of the northern Chuckwalla Valley. The open expanse of the valley floor includes a foreground to middleground flat desert landscape that is generally natural appearing and supports a sparse and irregular, to more uniform at distance, distribution of short grasses and shrubs of subdued color consisting of muted yellows, tans, browns, and greens. Although the rugged and visually interesting landforms of the Coxcomb Mountains and more distant Palen Mountains provide a backdrop of visual interest, the desert basin landscape is relatively non-descript and common to much of the Chuckwalla Valley.	**High** These lands are within the California Desert Conservation Area and are within the foreground/ middleground viewsheds of I-10, SR 177 (Rice Road), the Desert Lily Sanctuary ACEC, the Alligator Rock ACEC, and the Chuckwalla Mountains Wilderness.	**Interim**	**IV**	To provide for management activities that require major modification of the landscape character. The level of change to the characteristic landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic landscape elements.	**Moderate to High** This Alternative would result in the introduction of numerous visually noticeable to prominent built structures into a landscape generally lacking similar built features of industrial or technological character. The tubular steel poles and curvilinear conductors would result in moderate-to-strong levels of form and line contrast relative to the natural character of the existing landscape. Color contrast would be weak to moderate and texture contrast would be weak to moderate. Also, the transmission line would cause noticeable view blockage of the background Chuckwalla Valley floor and Coxcomb and Palen Mountains.	**Consistent** The moderate-to-high level of change would be allowed under the VRM Class IV management objective.	**BEFORE:** **Significant (Class I)** **AFTER:** **Same**	**VR-3 and VR-4**

Appendix G.3

Scenic Quality Field Inventory

Form 8400-1
(September 1985)
(Format Modified 2008)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Field Office: Palm Springs D06000 Date: 10/6/2009

Scenic Quality Rating Unit: Chuckwalla Valley Time (24hr format): 11:50

Unit Number: 21

1. Evaluators: CBrandt GLong

2. LANDSCAPE CHARACTER (Features)			
	A. Landform/Water	**B. Vegetation**	**C. Structures**
Form	Broad valley; flat to gentle slopes; very gently rolling	Rounded, clumpy, mottled form	Roads, settlements, substations, power lines, tall cylindrical poles; geometric
Line	Horizontal landscape; vast open space	Rounded, horizontally aligned	Vertical poles, buildings
Color	Light brown to buff-colored soils and rock	Brownish-green	White, beige, desert brown, silver, brown
Texture	Smooth valley floor	Mottled; medium to coarse vegetation	Smooth surfaces

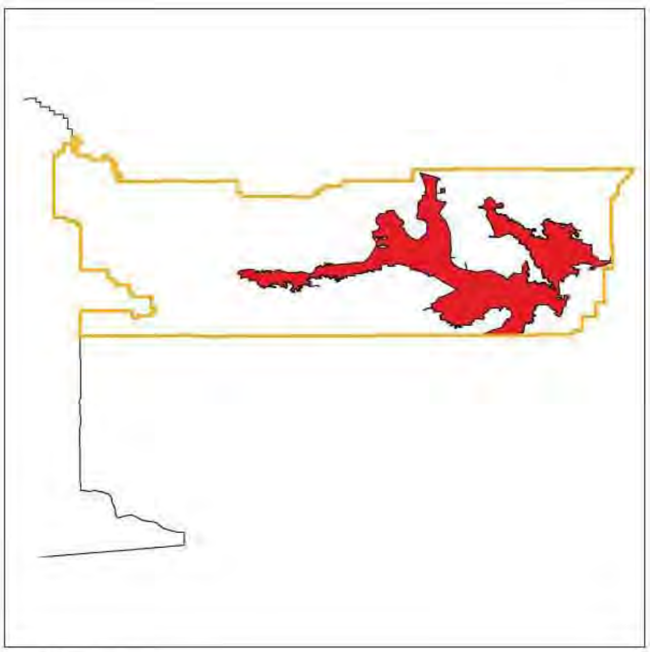
3. Narrative:

A broad, enclosed landscape surrounded on most sides by dramatic mountain ranges. Vast, natural-appearing. Vegetation is somewhat visually dominant.

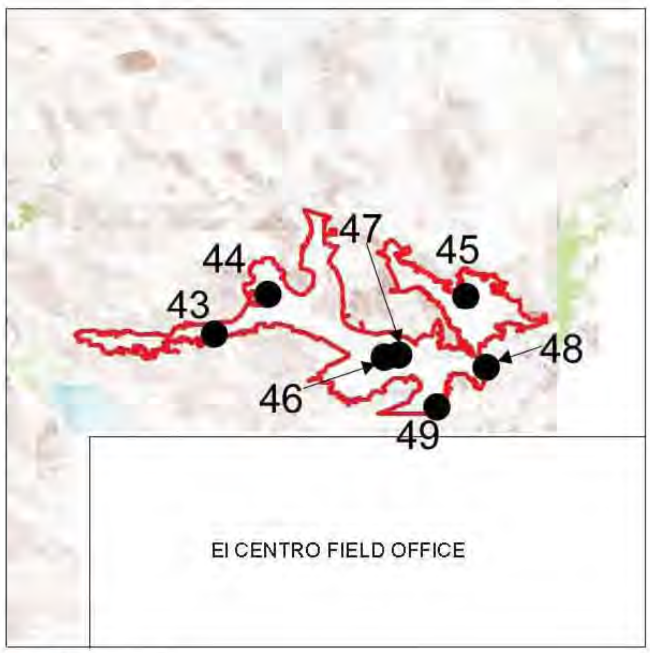
Scenic Quality Rating Unit: Chuckwalla Valley			
4. SCORE			
	Rating	**EXPLANATION OR RATIONALE**	**SCENIC QUALITY CLASSIFICATION** (check one)
a. Landform	1	Vast, low, gently rolling valley bottom	☐ **A – 19 or more**
b. Vegetation	3	Some variety of vegetation; one or two major types	☑ **B – 12 – 18**
c. Water	0	None present	☐ **C – 11 or less**
d. Color	2	Subtle variation; some contrast in soil, vegetation	
e. Adjacent Scenery	4	Dramatic mountains surrounding area	
f. Scarcity	2	Fairly distinctive but not unusual	☐ **Rehab**
g. Cultural Modification	0	Some cultural modification but overall natural-appearing	☐ **Special Area**
TOTAL	12		

Comments:

The valley is a vast area, homogenous in terms of landform and vegetation with no line or break to suggest subdividing into smaller units. Adjacent scenery is dramatic from all IOPs.



SQRU Locator



• IOP Location

Appendix G.4

Visual Contrast Rating Data Sheets

Visual Contrast Rating Data Sheet

Desert Harvest Solar Farm EIS

KEY VIEWPOINT DESCRIPTION

Key Observation Point

1 – Proposed Project

Location

JT Wilderness – lower elevation view at the northeast end of the Eagle Mountains and north end of Chuckwalla Valley, viewing south.

VRM Class

IV

Analyst

Michael Clayton

Date

October 13, 2011

CHARACTERISTIC LANDSCAPE DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Horizontal valley floor with horizontal to slightly angular mountain ranges	Fairly even distribution with some patchiness	Linear form of aqueduct
Line	Horizontal to irregular	Curvilinear as defined by drainage and aqueduct to horizontal (valley floor)	Curvilinear
Color	Tan to bluish hues at distance	Tans and pale to golden yellow grasses, muted to medium greens for shrubs	Bluish (water)
Texture	Smooth to matte	Matte	Smooth

PROPOSED ACTIVITY DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Same	Same	Simple linear
Line	Same	Barely noticeable horizontal demarcation as defined by graded areas	Horizontal to vertical though barely discernible
Color	Same	Same	Light gray
Texture	Same	Same	Smooth

DEGREE OF CONTRAST

	LANDFORM / WATER				VEGETATION				STRUCTURES			
	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG
Form	4				4					4		
Line	4					4				4		
Color	4				4					4		
Texture	4				4					4		

LEVEL OF CHANGE & VRM CLASS CONSISTENCY

Term: ☐ **Short** ☒ **Long**

Level of Change: ☐ **Very Low** ☒ **Low** ☐ **Moderate** ☐ **High**

Does the Project Design Meet VRM Objectives? ☒ **Yes** ☐ **No**

Visual Contrast Rating Data Sheet

Desert Harvest Solar Farm EIS

KEY VIEWPOINT DESCRIPTION

Key Observation Point

1A – Alternative 7

Location

JT Wilderness – lower elevation view at the northeast end of the Eagle Mountains and north end of Chuckwalla Valley, viewing south.

VRM Class

IV

Analyst

Michael Clayton

Date

January 16, 2012

CHARACTERISTIC LANDSCAPE DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Horizontal valley floor with horizontal to slightly angular mountain ranges	Fairly even distribution with some patchiness	Linear form of aqueduct
Line	Horizontal to irregular	Curvilinear as defined by drainage and aqueduct to horizontal (valley floor)	Curvilinear
Color	Tan to bluish hues at distance	Tans and pale to golden yellow grasses, muted to medium greens for shrubs	Bluish (water)
Texture	Smooth to matte	Matte	Smooth

PROPOSED ACTIVITY DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Same	Same	Simple linear
Line	Same	Slightly noticeable horizontal demarcation due to grading/structures	Horizontal solar field and barely discernible vertical transmission structures
Color	Same	Same	Light blue to light and dark grays depending on panel orientation and sun angle
Texture	Same	Same	Smooth

DEGREE OF CONTRAST

	LANDFORM / WATER				VEGETATION				STRUCTURES			
	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG
Form	4				4					4		
Line	4					4				4	4	
Color	4				4					4	4	
Texture	4				4					4		

LEVEL OF CHANGE & VRM CLASS CONSISTENCY

Term: ☐ **Short** ☒ **Long**

Level of Change: ☐ **Very Low** ☒ **Low** ☐ **Moderate** ☐ **High**

Does the Project Design Meet VRM Objectives? ☒ **Yes** ☐ **No**

Visual Contrast Rating Data Sheet

Desert Harvest Solar Farm EIS

KEY VIEWPOINT DESCRIPTION

Key Observation Point
2 – Proposed Solar Project

Location
JT Wilderness – higher elevation view along the western flank of the Coxcomb Mountains, viewing southwest over Chuckwalla Valley.

VRM Class
IV

Analyst
Michael Clayton

Date
January 16, 2012

CHARACTERISTIC LANDSCAPE DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Horizontal valley floor with horizontal to angular and irregular mountain ranges	Fairly even distribution with some linear patchiness defined by drainage	None readily apparent
Line	Horizontal to irregular and diagonal	Curvilinear as defined by drainage to horizontal as defined by valley floor	None readily apparent
Color	Tan to bluish hues at distance	Tans and pale to golden yellow grasses, muted to medium greens for shrubs	None readily apparent
Texture	Smooth to matte	Matte	None readily apparent

PROPOSED ACTIVITY DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Same	Same	Prominent geometric patterns and faintly noticeable verticals
Line	Same	Prominent horizontal to diagonal demarcations as defined by graded	Prominent horizontal to diagonal with barely discernible verticals
Color	Tan to bluish hues at distance with lighter tans of disturbed soils	Same	Light to medium gray
Texture	Same	Same	Smooth

DEGREE OF CONTRAST

	LANDFORM / WATER				VEGETATION				STRUCTURES			
	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG
Form	4				4							4
Line	4						4				4	4
Color			4		4						4	
Texture	4				4					4		

LEVEL OF CHANGE & VRM CLASS CONSISTENCY

Term: ☐ **Short** ☒ **Long** | **Level of Change:** ☐ **Very Low** ☐ **Low** ☒ **Moderate** ☒ **High**

Does the Project Design Meet VRM Objectives? ☒ **Yes** ☐ **No**

Visual Contrast Rating Data Sheet

Desert Harvest Solar Farm EIS

KEY VIEWPOINT DESCRIPTION

Key Observation Point

3 – Proposed Solar Project

Location

Kaiser Road in the immediate project vicinity, viewing east.

VRM Class

IV

Analyst

Michael Clayton

Date

October 26, 2011

CHARACTERISTIC LANDSCAPE DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Horizontal valley floor with horizontal to slightly angular mountain ranges	Patchy clumps to irregular and continuous at distance	None apparent
Line	Horizontal to diagonal and irregular	Irregular and indistinct to horizontal as defined by valley floor	None apparent
Color	Tan to lavender and bluish hues at distance	Tans and pale to golden yellow grasses, muted to dark greens for shrubs	None apparent
Texture	Smooth to granular and coarse	Matte	None apparent

PROPOSED ACTIVITY DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Same	Same	Geometric to simple linear
Line	Same	Noticeable horizontal to diagonal lines of demarcation as defined by graded areas	Vertical and diagonal to prominent horizontal
Color	Same	Same	Light to dark gray to bluish hue depending on angle of view and weather conditions.
Texture	Same	Same	Smooth

DEGREE OF CONTRAST

	LANDFORM / WATER				VEGETATION				STRUCTURES			
	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG
Form	4				4						4	4
Line	4						4				4	4
Color	4				4						4	
Texture	4				4						4	

LEVEL OF CHANGE & VRM CLASS CONSISTENCY

Term: ☐ **Short** ☒ **Long** | **Level of Change:** ☐ **Very Low** ☐ **Low** ☒ **Moderate** ☒ **High**

Does the Project Design Meet VRM Objectives? ☒ **Yes** ☐ **No**

Visual Contrast Rating Data Sheet
Desert Harvest Solar Farm EIS

KEY VIEWPOINT DESCRIPTION

Key Observation Point
3A – Alternative 7

Location
Kaiser Road in the immediate project vicinity, viewing northeast.

VRM Class
IV

Analyst
Michael Clayton

Date
March 23, 2012

Latitude: 33° 47' 43.15" N Longitude: 115° 24' 03.75" W

CHARACTERISTIC LANDSCAPE DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Horizontal valley floor with horizontal to slightly angular mountain ranges	Patchy clumps to irregular and continuous at distance	None apparent
Line	Horizontal to diagonal and irregular	Irregular and indistinct to horizontal as defined by valley floor	None apparent
Color	Tan to lavender and bluish hues at distance	Tans and pale to golden yellow grasses, muted to dark greens for shrubs	None apparent
Texture	Smooth to granular and coarse	Matte	None apparent

PROPOSED ACTIVITY DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Same	Same	Geometric to simple linear
Line	Same	Noticeable horizontal to diagonal lines of demarcation as defined by graded areas	Vertical and diagonal to prominent horizontal
Color	Same	Same	Tan, medium to dark gray to black, to bluish hue depending on panel orientation/weather
Texture	Same	Same	Smooth

DEGREE OF CONTRAST

	LANDFORM / WATER				VEGETATION				STRUCTURES			
	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG
Form	4				4						4	4
Line	4						4					4
Color	4				4						4	4
Texture	4				4						4	

LEVEL OF CHANGE & VRM CLASS CONSISTENCY

Term: ☐ **Short** ☒ **Long**

Level of Change: ☐ **Very Low** ☐ **Low** ☐ **Moderate** ☒ **High**

Does the Project Design Meet VRM Objectives? ☒ **Yes** ☐ **No**

Visual Contrast Rating Data Sheet

Desert Harvest Solar Farm EIS

KEY VIEWPOINT DESCRIPTION

Key Observation Point
4 – Proposed Project

Location
Near the western perimeter of the **Desert Lily Sanctuary ACEC**, just east of SR 177.

VRM Class
IV

Analyst
Michael Clayton

Date
October 26, 2011

CHARACTERISTIC LANDSCAPE DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Horizontal valley floor to horizontal and slightly rounded to irregular mountains	Patchy clumps to irregular and continuous at distance	Simple linear
Line	Horizontal to irregular and angular	Irregular and indistinct to horizontal as defined by valley floor	Vertical
Color	Tan to lavender and bluish hues at distance	Tans and pale to golden yellow grasses, muted to dark greens for shrubs	Dark brown
Texture	Smooth to granular and coarse	Matte	Smooth

PROPOSED ACTIVITY DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Same	Same	Indistinct simple linear of gen-tie transmission line
Line	Same	Same	Indistinct vertical
Color	Same	Same	Indistinct light gray
Texture	Same	Same	Indistinct smooth

DEGREE OF CONTRAST

	LANDFORM / WATER				VEGETATION				STRUCTURES			
	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG
Form	4				4					4		
Line	4				4					4		
Color	4				4				4			
Texture	4				4				4			

LEVEL OF CHANGE & VRM CLASS CONSISTENCY

Term: ☐ **Short** ☒ **Long**

Level of Change: ☒ **Very Low** ☐ **Low** ☐ **Moderate** ☐ **High**

Does the Project Design Meet VRM Objectives? ☒ **Yes** ☐ **No**

Visual Contrast Rating Data Sheet

Desert Harvest Solar Farm EIS

KEY VIEWPOINT DESCRIPTION

Key Observation Point

5 – Alternatives B and C

Location

Northbound Kaiser Road in the immediate vicinity of the Lake Tamarisk residential development.

VRM Class

IV

Analyst

Michael Clayton

Date

October 12, 2011

Latitude: 33° 44' 36.7" N Longitude: 115° 24' 02.3" W

CHARACTERISTIC LANDSCAPE DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Horizontal valley floor with horizontal to slightly angular and rounded mountains	Patchy to sequential clumps to irregular and continuous at distance	Linear road
Line	Horizontal to diagonal and irregular	Irregular and indistinct to horizontal and diagonal as defined by valley floor/road	Diagonal
Color	Tan to lavender and bluish hues at distance	Tans and pale to golden yellow grasses, muted to dark greens for shrubs	Light gray
Texture	Smooth to granular and coarse	Matte	Smooth to matte

PROPOSED ACTIVITY DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Same	Same	Geometric to simple linear
Line	Same	Same	Prominent vertical and horizontal (poles) to curvilinear (conductors)
Color	Same	Same	Light to dark gray
Texture	Same	Same	Smooth

DEGREE OF CONTRAST

	LANDFORM / WATER				VEGETATION				STRUCTURES			
	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG
Form	4				4							4
Line	4				4							4
Color	4				4						4	
Texture	4				4					4	4	

LEVEL OF CHANGE & VRM CLASS CONSISTENCY

Term: ☐ **Short** ☒ **Long** | **Level of Change:** ☐ **Very Low** ☐ **Low** ☐ **Moderate** ☒ **High**

Does the Project Design Meet VRM Objectives? ☒ **Yes** ☐ **No**

Visual Contrast Rating Data Sheet

Desert Harvest Solar Farm EIS

KEY VIEWPOINT DESCRIPTION

Key Observation Point
6 – Alternative D

Location
Eastbound I-10, approximately 0.8 mile west of the I-10 span, viewing to the northeast.

VRM Class
IV

Analyst
Michael Clayton

Date
October 26, 2011

Latitude: 33° 42' 13.1" N   Longitude: 115° 19' 36.7" W

CHARACTERISTIC LANDSCAPE DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Horizontal valley floor to rugged angular background mountains	Patchy clumps to irregular and continuous at distance	Linear road
Line	Horizontal to diagonal and irregular	Irregular and indistinct to horizontal as defined by valley floor	Diagonal
Color	Tan to lavender and bluish hues at distance	Tans and pale to golden yellow grasses, muted to dark greens for shrubs	Light gray
Texture	Smooth to granular and coarse	Matte	Smooth to matte

PROPOSED ACTIVITY DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Same	Same	Geometric to simple linear
Line	Same	Prominent horizontal to diagonal lines of demarcation as defined by graded areas	Prominent vertical (poles) to curvilinear (conductors)
Color	Same	Same	Light to dark gray
Texture	Same	Same	Smooth

DEGREE OF CONTRAST

	LANDFORM / WATER				VEGETATION				STRUCTURES			
	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG
Form	4				4							4
Line	4						4					4
Color	4				4						4	
Texture	4				4					4	4	

LEVEL OF CHANGE & VRM CLASS CONSISTENCY

Term: ☐ **Short** ☒ **Long** | **Level of Change:** ☐ **Very Low** ☐ **Low** ☐ **Moderate** ☒ **High**

Does the Project Design Meet VRM Objectives? ☒ **Yes** ☐ **No**

Visual Contrast Rating Data Sheet

Desert Harvest Solar Farm EIS

KEY VIEWPOINT DESCRIPTION

Key Observation Point **7 – Alternative E**	
Location **Northbound SR 177**, approximately 0.3 mile southwest of the span, viewing to the northeast.	
VRM Class **IV**	
Analyst Michael Clayton	
Date October 12, 2011	**Latitude: 33° 45' 58.5" N** **Longitude: 115° 20' 14.1" W**

CHARACTERISTIC LANDSCAPE DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Horizontal valley floor with horizontal to slightly angular and rounded mountains	Patchy to sequential clumps to irregular and continuous at distance	Linear road and utility poles
Line	Horizontal to diagonal and irregular	Irregular and indistinct to horizontal and diagonal as defined by valley floor/road	Diagonal to vertical
Color	Tan to lavender and bluish hues at distance	Tans and pale to golden yellow grasses, muted to dark greens for shrubs	Light to medium gray (road), dark brown (poles)
Texture	Smooth to granular and coarse	Matte	Smooth to matte

PROPOSED ACTIVITY DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Same	Same	Geometric to simple linear
Line	Same	Same	Prominent vertical and horizontal (poles) to curvilinear (conductors)
Color	Same	Same	Light to dark gray
Texture	Same	Same	Smooth

DEGREE OF CONTRAST

	LANDFORM / WATER				VEGETATION				STRUCTURES			
	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG
Form	4				4						4	4
Line	4						4				4	
Color	4				4						4	
Texture	4				4					4	4	

LEVEL OF CHANGE & VRM CLASS CONSISTENCY

Term: ☐ **Short** ☒ **Long**

Level of Change: ☐ **Very Low** ☐ **Low** ☒ **Moderate** ☒ **High**

Does the Project Design Meet VRM Objectives? ☒ **Yes** ☐ **No**

Visual Contrast Rating Data Sheet

Desert Harvest Solar Farm EIS

KEY VIEWPOINT DESCRIPTION

Key Observation Point

8 – Alternative E

Location

Westbound I-10, approximately 5.75 miles east of Desert Center, viewing north.

VRM Class

IV

Analyst

Michael Clayton

Date

October 13, 2011

CHARACTERISTIC LANDSCAPE DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Horizontal valley floor, horizontal to angular mountains	Patchy clumps to irregular and continuous at distance	None apparent
Line	Horizontal to diagonal and irregular	Irregular and indistinct to horizontal as defined by valley floor	None apparent
Color	Tan to lavender and bluish hues at distance	Tans and muted to dark greens for shrubs	None apparent
Texture	Smooth to granular and coarse	Matte	None apparent

PROPOSED ACTIVITY DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Same	Same	Geometric to simple linear
Line	Same	Same	Prominent vertical (poles) to less distinct curvilinear (conductors)
Color	Same	Same	Light gray
Texture	Same	Same	Smooth

DEGREE OF CONTRAST

	LANDFORM / WATER				VEGETATION				STRUCTURES			
	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG
Form	4				4						4	4
Line	4				4						4	4
Color	4				4					4	4	
Texture	4				4					4		

LEVEL OF CHANGE & VRM CLASS CONSISTENCY

Term: ☐ **Short** ☒ **Long**

Level of Change: ☐ **Very Low** ☐ **Low** ☒ **Moderate** ☒ **High**

Does the Project Design Meet VRM Objectives? ☒ **Yes** ☐ **No**

Visual Contrast Rating Data Sheet

Desert Harvest Solar Farm EIS

KEY VIEWPOINT DESCRIPTION

Key Observation Point
8A – Alternative 7

Location
Westbound I-10, approximately 5.75 miles east of Desert Center, viewing northwest.

VRM Class
IV

Analyst
Michael Clayton

Date
March 23, 2012

CHARACTERISTIC LANDSCAPE DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Horizontal valley floor, horizontal to angular mountains	Patchy clumps to irregular and continuous at distance	None apparent
Line	Horizontal to diagonal and irregular	Irregular and indistinct to horizontal as defined by valley floor	None apparent
Color	Tan to lavender and bluish hues at distance	Tans and muted to dark greens for shrubs	None apparent
Texture	Smooth to granular and coarse	Matte	None apparent

PROPOSED ACTIVITY DESCRIPTION

	LANDFORM / WATER	VEGETATION	STRUCTURES
Form	Same	Same	Geometric to simple linear
Line	Same	Same	Prominent vertical (poles) and noticeable horizontal (solar field)
Color	Same	Same	Light to dark grays to bluish hew (solar arrays) depending on view angle/weather.
Texture	Same	Same	Smooth

DEGREE OF CONTRAST

	LANDFORM / WATER				VEGETATION				STRUCTURES			
	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG	NONE	WEAK	MODERATE	STRONG
Form	4				4						4	4
Line	4				4						4	4
Color	4				4						4	
Texture	4				4					4		

LEVEL OF CHANGE & VRM CLASS CONSISTENCY

Term: ☐ **Short** ☒ **Long**

Level of Change: ☐ **Very Low** ☐ **Low** ☒ **Moderate** ☒ **High**

Does the Project Design Meet VRM Objectives? ☒ **Yes** ☐ **No**

Appendix G.5

Time-Lapse Visual Simulations

Appendix H

Traffic Impact Study

TRAFFIC STUDY

FOR

Desert Harvest Solar Project

Desert Center, California

Prepared for:

Aspen Environmental Group
235 Montgomery Street, Suite 935
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Prepared by:

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January 2012

REGISTERED PROFESSIONAL ENGINEER
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I. Introduction

A. Purpose of the TIA and Study Objectives

This analysis was prepared to identify traffic impacts and, if needed, propose mitigation of impacts, due to the construction of the Desert Harvest Solar Project (Project) proposed by enXco Development Corporation (enXco or Applicant). The Project includes a solar farm producing up to 150 MW of electrical power and the transmission line to carry the power to the soon to be constructed Red Bluff Substation. The Project will be located north of Desert Center in the unincorporated area of Riverside County[i].

This traffic study was completed with generally accepted procedures and reflects the opinions of Hernandez, Kroone & Associates (HKA). The methods used were based on the Highway Capacity Manual. The traffic study follows the outline in the Riverside County Transportation Department "Traffic Impact Analysis Preparation Guide", dated April 2008.

Measure of Impacts - The existing condition and the future conditions without project traffic is the yardstick to determine the magnitude of the project and its traffic impacts. The operation of the traffic without the project is compared to the operation of the traffic with the project. The measure used to compare the operation of the intersections or roads is called Level of Service.

Level of Service (LOS) is a measure of the effectiveness of an intersection or road. It rates intersections by the length of delay or road segments by a volume to capacity ratio.

A LOS of A means that the intersection has little delay. A LOS of F means the intersection has delays of over a minute. The magnitude of change in the LOS when the project trips are added to the intersection indicates the magnitude of the project's impact.

The LOS measure of effectiveness for a road is based on the ratio of the volume of traffic using the road segments to the capacity of the road segments. The traffic on a road operating at LOS A would move freely. The traffic on a road operating at LOS F would be traveling significantly less than the posted speed limit in stop / go congestions.

Appendix A has tables showing the ranges of delay for intersections and the volume to capacity (v/c) ratios for road segments for the various LOS categories.

In the County of Riverside, if the LOS decreases to below an LOS of C with the addition of the traffic generated by the proposed project (project traffic), it is considered to have an impact and mitigation may be required. Intersections under joint jurisdiction with Caltrans may operate at an LOS of E.

Intersections or road segments are selected for analysis based on the project traffic distribution anticipated. The study intersections were analyzed for delay and level of service (LOS) using HCS on the unsignalized intersections. The HCS software uses the Highway Capacity Manual 2000 methodology (HCM) for solving for LOS and delay.

The HCM analysis procedures include mathematically applied adjustment factors as part of the process in calculating the final LOS rating of an intersection. One of these adjustment factors is called the peak hour factor (PHF). This helps factor in the differences between an hourly volume and variations in minute increments within an hour. The PHF is defined by the *Highway Capacity Manual* as "...the ratio of total hourly volume to the peak rate of flow within the hour..." The traffic volume is divided by the PHF to adjust it to the maximum flow through the intersection.

HKA would like to acknowledge enXco Development Corporation and Aspen Environmental Group who provided several of the attached figures.

B. Site Location and Study Area (See Figure 1, AKA Draft Administrative EIS Figure 2-1)

The Project will be located near Desert Center, California, in the eastern portion of Riverside County, near the Joshua Tree National Park. The nearest communities are Eagle Mountain, Lake Tamarisk, and Desert Center. The solar panels will be constructed and operated at the "solar farm", approximately 5 miles north of Interstate 10 (I-10) along Kaiser Road. The Bureau of Land Management (BLM) administers the majority of the land in the area.

The State Route 177 / I-10 interchange is the nearest interchange. The interchange is approximately 50 miles east of Indio, California and 50 miles west of Blythe, California.

C. Development Project Identification - Riverside County Case Number and Related Cases

Not Applicable

D. Development Project Description

1) Project Size and Description (See Figure 2, AKA Draft Administrative EIS Figure 2-2)

The several alternatives to the projects are listed in Table 1.

Table 1: Desert Harvest Solar Project Alternatives

Alternative:	Brief Description:
1	No Action (No Plan Amendment)
2	No Development Action (with Plan amendment)
3	Proposed Solar Project – 150 MW Facility
4	Solar Project Excluding Palen-Ford Wildlife Habitat Management Area
5	Reduced Footprint Solar Project
A	No Gen-Tie
B	Proposed Gen-Tie (Shared Towers)
C	Separate Transmission Towers within same Right-of-Way
D	Cross-Valley Alignment for Gen-Tie
E	New Cross-Valley Alignment for Gen-Tie

This traffic study analyzed the traffic impacts of Alternative 3 Proposed Solar Project. This alternative is the most likely to be completed. It is also the largest acreage of solar facilities and will require the largest construction crew and probably create the most traffic impacts.

In order to demonstrate the traffic impacts of Alternative 3, traffic impacts of the existing or "No Action" Alternative will be developed. The difference in the traffic impacts between the "No Action" and "Proposed Solar Project" alternatives are the traffic impacts due to the project.

The components of Alternative 3 Proposed Solar Project are as described as: "… a 150 MW nominal capacity, alternating current (AC) solar photovoltaic (PV) energy-generating project. The project would consist of a main generation area, operations and maintenance (O&M) facility (either on or off site), on-site substation, switchyard, and site security. The project would be located on lands administered by the BLM, Palm Springs-South Coast Field Office in Riverside County, approximately 5 miles north of Desert Center. The project would be located on 1,208 acres, and would be comprised of two separate parcels separated by a desert wash. The northern parcel consists of 1,053 acres and the southern parcel consists of 155 acres."[ii]

Construction facilities will include PV arrays, switchyard, inverters, overhead lines, access corridors (maintenance roads), and on-site substation. The O&M facility may be built on site or it may be a remodel facility that is within 10 miles of the solar project. Site security includes a guard building, fencing and lighting.

The solar project will have little manpower requirements once it is constructed and connected. The O&M Facility will be manned during operation of the Project. The guard shack will be manned 24 hours a day during the construction and operation of the Solar Farm.

It is anticipated that approximately 10 people will arrive and leave the site daily for operation and maintenance. The majority of the staff will be at the site during daylight hours but occasionally testing or maintenance work will require night work.

It is assumed that 10 people will arrive and leave the site daily for guard duty. Their shifts are assumed to be 12 hours long, with 5 working each shift.

Analysis of the traffic impacts of the Gen-tie Line Alternatives was not part of this traffic study. The following paragraph is being included as information.

A transmission line (Gen-Tie Line) will be needed to transport the power generated by the Desert Harvest Solar Project to the Red Bluff Substation near the I-10. There are several alternatives for the routing of this above ground transmission line. Four alternatives are proposed and shown on exhibits in Appendix A. Two of the alternatives will use the same right-of-way that will be used by the Desert Sunlight Solar Farm. Alternative B has the two solar facilities sharing the same towers.

The Red Bluff Substation was not part of the Desert Harvest Solar Project. Its traffic impacts were not analyzed in this traffic study, but it is being built in this area. The following paragraph is included for information.

The Red Bluff Substation is being construction by Southern California Edison (SCE) near the I-10. It will connect the Gen-Tie transmission line from the Desert Sunlight Solar Farm and the Desert Harvest Solar Project to the existing Devers-Palo Verde (DSPV) transmission line. Its components include:

- Red Bluff Substation: 500/220 kV substation on approximately 90 acres
- Transmission Lines: Approximately 2,000 feet of new transmission lines (two lines of approximately 1,000 feet each), to connect to the existing DSPV transmission line
- Generation Tie Line Connection: Connect the TRANSMISSION LINE to the Red Bluff Substation
- Modification of existing 220 kV structures
- Distribution Line for Substation Light and Power: Approximately 300 feet of 12 kV overhead distribution line and approximately 1,000 feet of underground distribution line (to provide substation light and power)
- Telecommunications Facilities: Install optical ground wire (OPGW) on the DSPV interconnection generation tie-line

2) Existing Land Use and Zoning

The Project will be located on land within the BLM's charge. The land use is open space. The Desert Center Area Land Use map from the County of Riverside General Plan is included in Appendix A.

3) Proposed Land Use and Zoning

No zoning changes are proposed by the Project's Plan of Development (POD). Renewable energy generation or transmission facilities are not expressly allowed nor prohibited under the zoning ordinances but permitting may be required by County of Riverside for the use of private property in this manner.

The Project component will require buildings, fencing and arrays on approximately 1,200 acres of BLM land.

4) Site Plan of Proposed Project (reduced) Figure 2

5) Proposed Project Opening Year – 2014

6) Any Proposed Project Phasing – No project phasing is planned but the construction work will be so that limited areas of soil will be disturbed at a time.

7) Indicate if Project is within a City Sphere of Influence –

The project is not within the sphere of influence of any city.

II. Area Conditions

A. Identify Study Area and Intersections (Figures 3 and 4)

Access to the Project is provided by Kaiser Road, a major road with 118 feet of right of way. It is predominately a north-south paved road that ends at State Route 177 (SR-177) at the south and at Eagle Mountain Landfill at the north end. It is one lane in each direction. It is mostly traveled by local residents. During a two hour period on a typical weekday, HKA observed three vehicles on the road north of its intersection with SR-177.

SR-177 is predominantly a north-south road that provides access for Kaiser Road from the I-10. According to the Desert Center Area Plan by the County of Riverside, it is a Mountain Arterial with 110 feet of right of way.[iii] It connects I-10 to SR 62, another east-west route in eastern Riverside County, approximately 30 miles north of Desert Center. SR-177 is one lane in each direction with centerline and edge of pavement markings.

The I-10 is an east-west interstate starting in Santa Monica, CA and ending in Florida. At this location it is two lanes in each direction.

There is an east-west road named Ragsdale Road between the I-10 and the SR-177 / Kaiser Road intersection that was not studied or counted. At the time the background counts were taken, the road appeared be a frontage road between the Eagle Mountain / I-10 interchange and the SR-177 / I-10 interchange. It dead ends east of the SR-177.

Intersections were selected based on project trips, proposed distribution and the anticipated use of the SR-177 interchange to reach the Project site.

Intersections to be analyzed are:

- SR-177 / I-10 EB Ramp
- SR-177 / 1-10 WB Ramp
- SR-177 / Kaiser Road

B. Existing Traffic Controls and Intersection Geometrics (Figure 5)

SR-177 is the main road and is not stop controlled. The intersecting roads with SR-177 are stop controlled. The geometrics of the intersections are shown in Figure 5 and in Table 2.

Table 2: Existing Geometrics

Intersections	NB			SB			EB			WB		
	L	T	R	L	T	R	L	T	R	L	T	R
SR-177 / I-10 EB Ramp	-	1	S	S	1	-	1	1	Y	-	-	-
SR-177 / I-10 WB Ramp	S	1	-	-	1	S	-	-		S	1	S
SR-177 / Kaiser Road	S	1	-	-	1	S	S	-	S	-	-	-

S – Turning Movement is shared with adjacent movement.
Y – Turning movement must yield but is not stopped controlled. Has a separate lane.

C. Existing Traffic Volumes - AM and PM Peak Hour Turning Movements and Roadway Links) (Figure 6A - AM and Figure 6B - PM)

Turning movement counts and a 24 hour classification count were taken by Counts Unlimited (See Appendix B) on November 22, 2011. Only 119 vehicles used Kaiser Road north of Lake Tamarisk Resort during the 24 hour period counted.

The volumes shown on Figures 6A and 6B are in passenger car equivalents (PCEs). Large trucks move through surface streets and intersections more slowly than cars and take more time to move through intersections. Since the analysis procedures are based on the number of passenger cars, the trucks must be converted to an equivalent number of cars. The existing truck trips were converted to passenger car equivalents (PCEs) by using the following factors:

Classification	Passenger Car Equivalents
Cars	1
Large 2-axle Vehicles	1.5
3-axle Vehicles	2
4 or more axle Vehicles	3

The calculations of the PCEs are included in Appendix B.

Data on the volume of the I-10 in the project area was obtained from the Caltrans 2010 Annual Average Day Traffic Data (Appendix A). The peak hour volume on the I-10 near the SR-177 interchange is in the 2,500 to 2,700 range.

D. Existing Delay and Level of Service (LOS) at Study Intersections / Roadway Links

Using the existing peak hour volumes and geometrics, the following LOS resulted at the study intersections. The detailed printouts are in Appendix C.

Table 3: LOS Summary for Existing Conditions and Traffic Volumes

Intersection	Control	AM Peak Period		PM Peak Period	
		Delay, sec	**LOS**	**Delay, sec**	**LOS**
SR-177 / I-10 EB	EB Off Ramp Stops	9.0	A	9.3	A
SR-177 / I-10 WB	WB Off Ramp Stops	9.1	A	9.7	A
SR-177 / Kaiser RD	SB Kaiser RD Stops	8.5	A	8.8	A

Since SR-177 is not controlled, traffic movements on SR-177 will maintain an LOS A. The movements of concern are those at the stop-controlled approach, as they must yield to the traffic on SR-177. Furthermore adequate gaps in the traffic stream or queues need to be available to left and right turning vehicles as shown above. The existing traffic volumes operate at an acceptable LOS in both the AM and PM Peak Periods.

E. Provide Copy of General Plan Circulation Element in the Project Vicinity *(Figure 7)*

F. Indicate if Transit Service is Available in the Area and Along which Routes *(Appendix A)*

There is no public transportation along SR-177. Greyhound Bus Service and perhaps other commercial bus lines travel east and west along I-10 without designated stations at SR-177.

III. Projected Future Traffic

A. Project Traffic and Project Phasing (each study year)

1) Ambient Growth Rate

The desert cities of the County of Riverside experienced rapid growth in the recent boom period. Table 4 shows the growth of the two nearest cities based on numbers from the U.S Census Bureau website.

Table 4: Population Growth at I-10 Communities

City	Population			
	1990	**2000**	**2009**	**Growth Rate, %**
Blythe, CA	8,448	20,465	21,329	152
Indio, CA	36,850	49,116	82,230	123

The I-10 communities in the area have shown an approximately 135% growth rate over that 19 year span. However the unincorporated areas have not grown as rapidly. Table 5 shows rates of growth of about 45% over the same period in the unincorporated areas.

Table 5: Population Growth in Unincorporated County of Riverside

	Population			
	1990	**2000**	**2009**	**Growth Rate, %**
Balance of County	385,384	420,721	558,214	45

Caltrans provides a history of annual average daily traffic counts at interchanges throughout the state. The difference between volume of traffic west of the interchange and the volume of traffic east of the interchange is the net traffic exiting and entering at the interchange. An increase in traffic indicates an increase in the population or employment activity near that location.

Comparing the net traffic, the difference in the traffic on either side of the interchange as an indication of the traffic accessing the Desert Center area, shows a slower rate of growth. During the 1998 – 2008 time period, the growth in net traffic at the SR-177 ramp was 14%, an average rate of about 1.5% per year in net change. This is probably a more accurate number for the anticipated growth in the area. For the purposes of this analysis, a 3% total growth in the background traffic during the construction period was used. That would be an annual growth rate of 1.5% over a 2 year period.

Table 6: Caltrans Annual Average Daily Traffic Counts at SR-177 / I-10 Interchange

1998			2008			Growth Rate of Net Traffic, %
West of Interchange	**East of Interchange**	**Net Traffic**	**West of Interchange**	**East of Interchange**	**Net Traffic**	
15,100	13,700	1,400	23,000	21,400	1,600	14

2) Project Trip Generation

Project trips are the volume of traffic that will be added to the road system because of the development of the project. Since this land is currently undeveloped, all trips that will be generated by the project are considered to be project trips for the purposes of this study.

There are several ways to estimate the trips generated by a project. One way is to use data collected from a large number of similar projects. Such data has been compiled by the Institute of Transportation Engineers, "ITE Trip Generation Handbook." These data points have been plotted and best fit curves through these data points have been developed. However, the construction of a solar farm, substation, and transmission lines or the operation of these facilities is not identified in the ITE Trip Generation Handbook.

Therefore, an analysis of individual site activities including employment, deliveries of construction materials and equipment, the construction schedule, and future operational activities and resulting trips needs to be studied individually to identify the trips generated at varying phases of project development.

Furthermore, these trips need to be identified as to those trips occurring during the hours of expected peak traffic on the road. Generally there are two times when the existing traffic volume is highest: between 0600-0900 and 1600-1800 on a normal week day. The impacts of the traffic are studied for the peak one hour period during each of those two periods. The discussion that follows describes how the estimate the project trips of concern for both the AM and PM Peak Periods was generated.

Opening Day Project Trips - The project trips for the operation and maintenance of the Desert Harvest Solar Project will be low.

Given an Operation and Maintenance staff of 10 per shift, it is anticipated approximately 1 round trip by each will be made to the project site. About 5 delivery trips per weekday are anticipated. Table 7 shows an anticipated schedule of the trips to and from the site each day.

Table 7: Operation and Maintenance Project Trips

Buildings	Staff per shift	Shifts	ADT Trips (one-way)	AM Peak Period		PM Peak Period	
				IN	OUT	IN	OUT
O&M, etc.	10	0600 – 1800	20	-	-	-	-
	10	1800 – 0600	20		10	10	-
Guard Shack	5	0600 – 1800	10	-	-	-	-
	5	1800 – 0600	10	-	5	5	-
Deliveries		0800 – 1700	10	1	1	1	1
Total			**70**	**1**	**16**	**16**	**1**

This results in total Opening Day project trips of 17 trips during the AM and PM Peak Periods. An increase of 17 trips during the peak hour does not impact the intersections or roadway. The existing intersections and roadways have sufficient capacity to absorb these 17 trips without a decrease in LOS or operation. There is no concern for impacts to the study roads or intersection and no need for mitigation due to the operation and maintenance project trips for the Project.

A future analysis (20 year scenario) with these 17 trips was not performed. The project trips are not anticipated to change since the activity which generated the trips is not likely to change. The future background intersection volumes will increase based upon growth rates established earlier. However traffic forecasting for a 20 year scenario is not an exact science. The volumes forecasted will have a variance of more than these 17 project trips. Therefore, a future LOS was not performed.

Additionally the Riverside County Transportation Department Traffic Impact Analysis Preparation Guide does not require the analysis of intersections that receive less than 50 Peak Period project trips. The Project does not generate at least 50 Peak Period project trips during the operation and maintenance of its components after construction. The Project will generate at least 50 Peak Period project trips during the construction of its components. Construction traffic impacts will be analyzed.

Construction Traffic Project Trips- Frequently the impacts of the project trips during construction are ignored due to the limited duration and temporary nature of the impacts. The construction period of this project is expected to take from 2012 through 2014 or a little over 2 years. The number of project trips identified for Opening Day and the 20 year future scenario are too low to be significant. Therefore, the project trips from the construction activities were selected for impact analysis.

Construction Worker Project Trips –
Solar Project – The construction and management workers required are expected to peak at about 250 employees. Construction workers are expected

to be on site between 0700 – 1900. The hours may be adjusted for particular construction efforts (concrete pours) or to avoid the worst of the summer heat.

The project trips for the construction workers are shown in the following table. The calculations and assumptions leading to this table are given in more detail in Appendix B.

Table 8: Project Trips during Construction

Component	Daily Trips, PCEs	AM Peak Period		PM Peak Period	
		IN	OUT	IN	OUT
Solar Project	426	125	0	-	125
Guard Crew	20	0	5	-	0
Total	446	125	5	-	125

Construction Equipment Project Trips - The "Desert Harvest Solar Project Draft EIS and CDCA Plan Amendment", by Aspen Environmental Group November 2011 provided a great deal of information regarding quantities and types of vehicles that will be used for the construction of the Project and the materials that will be hauled to the construction site. It is anticipated that approximately 600 loads will be brought to the site over the course of the construction effort. The majority of the equipment and materials will be brought to the site via oversized vehicles.

Since access to the site requires driving the oversized vehicles on state controlled roads (I-10, SR-177, etc), permits from Caltrans are required. Those permits require the oversized vehicles to access the State's roads outside of the peak traffic periods.

The equipment will be brought to the site as needed and will not impact the public roads again until they depart. Most of this equipment will be brought to the site prior to the maximum level in construction worker traffic.

It is anticipated that an average of about 20 large vehicles will deliver equipment or material each day. Even though there may be several deliveries of materials a day for most of the construction period, most of these vehicles are not expected to move during the peak traffic periods. The only exception to this norm will be when concrete is being poured.

A concrete batch plant may be set up on site but if not concrete will be delivered in 10 cubic yard mixers to the project site from communities to the east. These vehicles have 3 axles on the road and move during all hours of the day.

Since concrete needs to be poured in cooler temperatures, the concrete trucks frequently move during the AM Peak Period. When the pouring sites are set up efficiently, up to 3 mixers can arrive, be unloaded and leave in an hour. For the purposes of this analysis, it is assumed that concrete is being poured in two sites at one time and that 6 mixers will arrive at the site and 5 mixers will leave the site in an hour's time during the AM Peak Period.

For the concrete to be unloaded effectively, the site needs to be set up and ready to go. This normally means that part of the construction crew has arrived earlier to set up the site. Approximately 10% of the workers were estimated to arrive earlier to set up the site.

Large trucks move through surface streets and intersections more slowly than cars and take more time to move through intersections. Since the analysis procedures are based on the number of passenger cars, the concrete mixer must be converted to an equivalent number of cars. The project truck trips were converted to passenger car equivalents (PCEs) by using a factor of 3. Using a PCE of 3 per concrete mixer, the number of project trips due to concrete mixers is 18 PCEs arriving and 15 PCEs leaving the AM Peak Period.

Concrete will not be poured during all peak traffic periods during the construction. But since the deliveries of large loads that are not oversized could happen during the peak periods, the inclusion of almost a third of the daily deliveries during the AM Peak Period results in a conservative estimate for the analysis.

Table 9: Construction Project Trips, PCEs

Component	**Daily Trips, PCEs**	**AM Peak Period**		**PM Peak Period**	
		IN	OUT	IN	OUT
Solar Project	426	125	0	0	125
Guards	20	0	5	0	0
Personnel Subtotal	**446**	**125**	**5**	**0**	**125**
Deliveries, Concrete, Equipment	Varies	18	15	0	0
Total	**-**	**143**	**20**	**0**	**125**

3) Project Trip Distribution and Assignment *(Figures 8 and 9)*

Access to the site will be primarily from I-10 via SR-177 and Kaiser Road. The majority of the construction workers will be assigned to the SOLAR FARM off Kaiser Road.

Construction Workers Distribution – The construction workers will access the site via the SR-177 / I-10 interchange. Those working at the Project will turn north at the interchange and travel on SR-177 to Kaiser Road to the site.

Given the low population density in the area it was assumed that only about 6% of the workers would come from the local area. The distribution assigned half of them as arriving from Eagle Mountain, a community north of the Project site and the other half arriving from the northeast using SR-177.

The remainder of the employees was distributed to arrive via I-10. The population centers, with available workers, are primarily west of the SR-177 / I-10 interchange. Due to the difference in population densities, the remaining construction worker traffic was divided approximately 70% - 30% west and east of the interchange.

Concrete Trucks – The project distribution has all concrete trucks arriving and leaving to the east from Blythe. A plant may be set up on site but concrete deliveries were included for this analysis.

Figure 8 shows the inbound project trip distribution in terms of percentage. The outbound distribution of project trips would be the opposite of the inbound distribution. Figure 9 shows the project trips distribution in terms of PCEs.

4) Other Factors Affecting Trip Generation (identify any factors used to adjust trip generation, such as pass-by trips, internal trips, or modal choice.

The Project is a destination that does not lend itself to pass-by trips, internal trips, or modal choice.

5) Construction Project Peak Hour Turning Movement Traffic

See Figures 8 and 9 discussed above.

6) Project Completion or Phase Completion Traffic Volumes

See Section III. A. 2. The construction worker traffic exceeds traffic generated by operation and maintenance activities and as such is the only traffic that needs to be considered in this traffic study.

C. Cumulative Traffic (background)

1) Ambient Growth Rate

See section III.A.1.

2) Identify Location of Other Approved or Proposed Development Projects

Cumulative traffic impacts are a concern when new projects have been approved, are funded for construction, but are currently not opened. In the near future, these projects would generate additional traffic trips throughout the study area. At the time of the data collection for existing traffic volumes, these cumulative project trips cannot be collected and must be estimated.

The Riverside County staff was contacted for the names and status of projects in the area. At this time none were identified that would used the intersections other than the Desert Sunlight Solar Farm and the Red Bluff Substation. The Farm and the Red Bluff Substation are under construction but are not contributing large numbers of vehicles on the road at this time.

3) Trip generation from Other Approved Projects – The Desert Sunlight Solar Farm is under construction. The Desert Sunlight Solar Farm Transmission line will soon be under construction. The Red Bluff Substation is or will be under construction soon. The counts taken in November did not show a high level of construction traffic at the time.

The highest months of construction traffic for the Desert Sunlight Solar Farm were anticipated to be the 5th and 6th months of construction. That period will be over before the Desert Harvest Solar Project begins construction.

To conservatively account for the construction traffic generated by the Desert Sunlight Solar Farm Project, half of its projected traffic for the Farm construction, the transmission line and Red Bluff Substation construction trips were included. Trips were included in the construction year scenario. The trip estimates and distribution for Desert Sunlight Farm Project are shown in Table 10 and diagramed on Figure 11. Details of how the Desert Sunlight Solar Farm project trips were developed are in Appendix B.[iv]

Table 10: Desert Sunlight Solar Farm Construction Project Trips, PCEs

Component	Daily Trips, PCEs	AM Peak Period		PM Peak Period	
		IN	OUT	IN	OUT
SOLAR FARM & TRANSMISSION LINE	204	88	2	-	10
RED BLUFF SUBSTATION	108	46	-	-	8
Visitors, etc.	10	-	-	-	-
Personnel Subtotal	**322**	**134**	**2**	**-**	**18**
Deliveries, Concrete, Equipment	-	18	15	-	-
Total	-	**152**	**17**	**-**	**18**

4) Trip Distribution and Assignment of Other Approved Development Projects - Not Applicable.

5) Total Background Peak Hour Turning Movement Volumes (Figures 10A and 10B)
The background traffic counted at the site was increased by 3% to project the background traffic expected during the construction period. To conservatively account for the construction traffic generated by the Desert Sunlight Solar Farm

Project, half of its projected traffic for the Farm construction, the transmission line and Red Bluff Substation construction trips were included.

IV. Traffic Analysis

A. Capacity, Level of Service and Improvement Analysis - Intersections

1) Delay and LOS for Existing Conditions

See Section II. D. LOS printouts are in Appendix C.

Table 11: LOS Summary for Existing Conditions and Traffic Volumes

Intersection	Control	AM Peak Period		PM Peak Period	
		Delay, sec	LOS	Delay, sec	LOS
SR-177 / I-10 EB	EB Off Ramp Stops	9.0	A	9.3	A
SR-177 / I-10 WB	WB Off Ramp Stops	9.1	A	9.7	A
SR-177 / Kaiser RD	SB Kaiser RD Stops	8.5	A	8.8	A

2) Delay and LOS for Project Conditions

For this project, the only activity which generates a traffic concern is the construction work. Normally construction impacts are not of concern as they are of short duration and temporary. Typically, the project trips are added to the opening day and future year scenario background traffic and it is the combination of those two volumes which generate a traffic impact. However, in this situation the existing ADT of the streets is in the 100 ADT range. The project trips added by the Project for Opening Day don't generate enough traffic volume warranting an evaluation or creating an impact.

In this situation the construction period will continue for more than 2 years and the number of vehicles used during construction will be substantially more than the anticipated volumes of traffic during the operation and maintenance of the Project. The construction traffic impacts were analyzed. More detailed LOS analysis printouts can be found in Appendix C.

Table 12: LOS Summary for Construction Period

Intersection	Control	Without Project		With Project	
AM Peak Period		Delay, sec	LOS	Delay, sec	LOS
SR-177 / I-10 EB	EB Off Ramp Stops	9.1	A	10.0	B
SR-177 / I-10 WB	WB Off Ramp Stops	9.1	A	9.9	A
SR-177 / Kaiser RD	SB Kaiser RD Stops	8.5	A	8.6	A

Intersection	Control	Without Project		With Project	
PM Peak Period		**Delay, sec**	**LOS**	**Delay, sec**	**LOS**
SR-177 / I-10 EB	EB Off Ramp Stops	9.3	A	9.8	A
SR-177 / I-10 WB	WB Off Ramp Stops	9.7	A	10.1	B
SR-177 / Kaiser RD	SB Kaiser RD Stops	8.8	A	9.6	A

To summarize the information in Table 12, the impact of the construction traffic to the background traffic expected during the construction period increased the delay at all intersections by less than one second. The construction traffic for this Project had no significant traffic impact at the intersections.

3) Delay and LOS under Cumulative Conditions

The construction period for both the Desert Sunlight Solar Farm and the Desert Harvest Solar Project will overlap. To conservatively account for the construction traffic generated by the Desert Sunlight Solar Farm Project, half of its projected traffic for the Farm construction, the transmission line and Red Bluff Substation construction trips were included as cumulative trips. The LOS of the anticipated background traffic and the Desert Sunlight Solar Farm Project and the Project traffic are included in Table 13. More detailed LOS analysis printouts can be found in Appendix C.

Table 13: LOS Summary for Cumulative Conditions

Intersection	Control	Without Project		With Project	
AM Peak Period		**Delay, sec**	**LOS**	**Delay, sec**	**LOS**
SR-177 / I-10 EB	EB Off Ramp Stops	9.4	A	10.6	B
SR-177 / I-10 WB	WB Off Ramp Stops	9.4	A	10.5	B
SR-177 / Kaiser RD	SB Kaiser RD Stops	8.6	A	8.7	A
PM Peak Period		**Delay, sec**	**LOS**	**Delay, sec**	**LOS**
SR-177 / I-10 EB	EB Off Ramp Stops	9.3	A	9.9	A
SR-177 / I-10 WB	WB Off Ramp Stops	9.7	A	10.1	B
SR-177 / Kaiser RD	SB Kaiser RD Stops	8.8	A	9.6	A

To summarize the information in Table 13, the impact of the construction traffic plus the anticipated background traffic and cumulative traffic volumes expected during the construction period increased the delay at all intersections by less than two seconds. The LOS did not deteriorate at the intersection of SR 177 / Kaiser Road. The LOS was lowered at the other intersections, but the impact was negligible.

The construction traffic for this Project had no significant traffic impact at the intersections.

V. Findings and Recommendations

A. Traffic Impacts and Level of Service Analysis

This analysis was prepared to identify traffic impacts and, if needed, propose mitigation of impacts, due to the construction of the Desert Harvest Solar Project (Project) proposed by enXco Development Corporation (enXco or Applicant). The Project includes a solar farm producing up to 150 MW of electrical power and the transmission line to carry the power to the soon to be constructed Red Bluff Substation. The Project will be located north of Desert Center in the unincorporated area of Riverside County[v].

This traffic study was completed with generally accepted procedures and reflects the opinions of Hernandez, Kroone & Associates (HKA). The methods used are based on the Highway Capacity Manual. The traffic study follows the outline in the Riverside County Transportation Department "Traffic Impact Analysis Preparation Guide", dated April 2008.

The project trips were generated and distributed. The Project will generate less than 20 trips per peak traffic period after construction is completed. As analysis is not required at intersections with less than 50 peak hour trips, an Opening Day and Future Year (20 year scenario) was not completed.

However due to the length of the construction period, the construction traffic impacts were evaluated. Based on the construction trips and the distribution of those trips the following intersections were selected for analysis:

- SR-177 / I-10 EB Ramp
- SR-177 / 1-10 WB Ramp
- SR-177 / Kaiser Road

As noted before, the future conditions without project traffic is the yardstick to determine the magnitude of the project and its traffic impacts. The operation of the traffic without the project is compared to the operation of the traffic with the project to identify the traffic impacts. The measure of the operation of the traffic is called the Level of Service (LOS).

The study intersections were analyzed for the AM and PM peak traffic periods for the **without** project condition and the **with** project condition during the construction period. Counts were taken at these intersections, those volumes were increased by 3% to account for the increase in background traffic over the next two years to model the without project condition. The project trips were added to model the **with** project condition.

The Highway Capacity Software was used to calculate the LOS. Table 11 is a summary of the current operation of the intersections. All intersections currently operate at a LOS of A.

Table 12 summarizes the operation of the intersections during the construction time period.

Table 13 summarizes the operation of the intersection during the construction time period with the addition of the cumulative traffic volumes. Under these conditions the delay at all intersections increased by less than two seconds. The LOS did not deteriorate at the intersection of SR 177 / Kaiser Road. The LOS was lowered at the other intersections but it did not show a significant impact. The construction traffic for this Project had no significant traffic impact at the intersections.

The Project has no traffic impacts at the study intersections and no mitigation is required.

The construction traffic will add a number of large vehicles to the local roads. Being a "good neighbor" during construction might include the following efforts:

- Sweeping the paved roads periodically to cut down on dust picked up by the construction vehicles
- Documenting the current state of the roads (video and pavement coring) to be used during construction and returning the roads to the current level after construction.

B. Traffic Signal Warrant Analysis

No traffic signal warrant analysis is needed.

C. Circulation requirements

No on-site or area wide circulation improvements are needed.

Figure 1 – Aspen Environmental Group Figure 2-1 Project Overview (Vicinity Map)
Figure 2 – Aspen Environmental Group Figure 2-2 Alternative 3 Proposed Solar Project
Figure 3 – Photos of Intersections
Figure 4 – Photos of Intersections
Figure 5 – Existing Lane Configurations
Figure 6A – AM Existing Traffic in PCEs
Figure 6B – PM Existing Traffic in PCEs
Figure 7 – General Plan Circulation Element
Figure 8 - Project Trip Distribution, %
Figure 9 - Project Trip Distribution, PCEs
Figure 10A – AM Background Traffic Adjusted for Construction Period w/o Project
Figure 10B – PM Background Traffic Adjusted for Construction Period w/o Project
Figure 11 – Desert Sunlight Solar Farm Project Trips
Figure 12A – AM Background with Cumulative Traffic Volumes, in PCEs
Figure 12B – PM Background with Cumulative Traffic Volumes, in PCEs

[i] Aspen Environmental Group, “Desert Harvest Solar Project Draft EIS and CDCA Plan Amendment”, November 2011, page 2-1.
[ii] Aspen Environmental Group, “Desert Harvest Solar Project Draft EIS and CDCA Plan Amendment”, November 2011, page 2-4 and page 2-5.
[iii] Riverside County Integrated Project, Desert Center Area Plan Circulation, Figure 6.
[iv] Hernandez, Kroone & Associates, Traffic Study for “Desert Sunlight Solar Farm”, June 2010.
[v] Aspen Environmental Group, “Desert Harvest Solar Project Draft EIS and CDCA Plan Amendment”, November 2011, page 2-1.

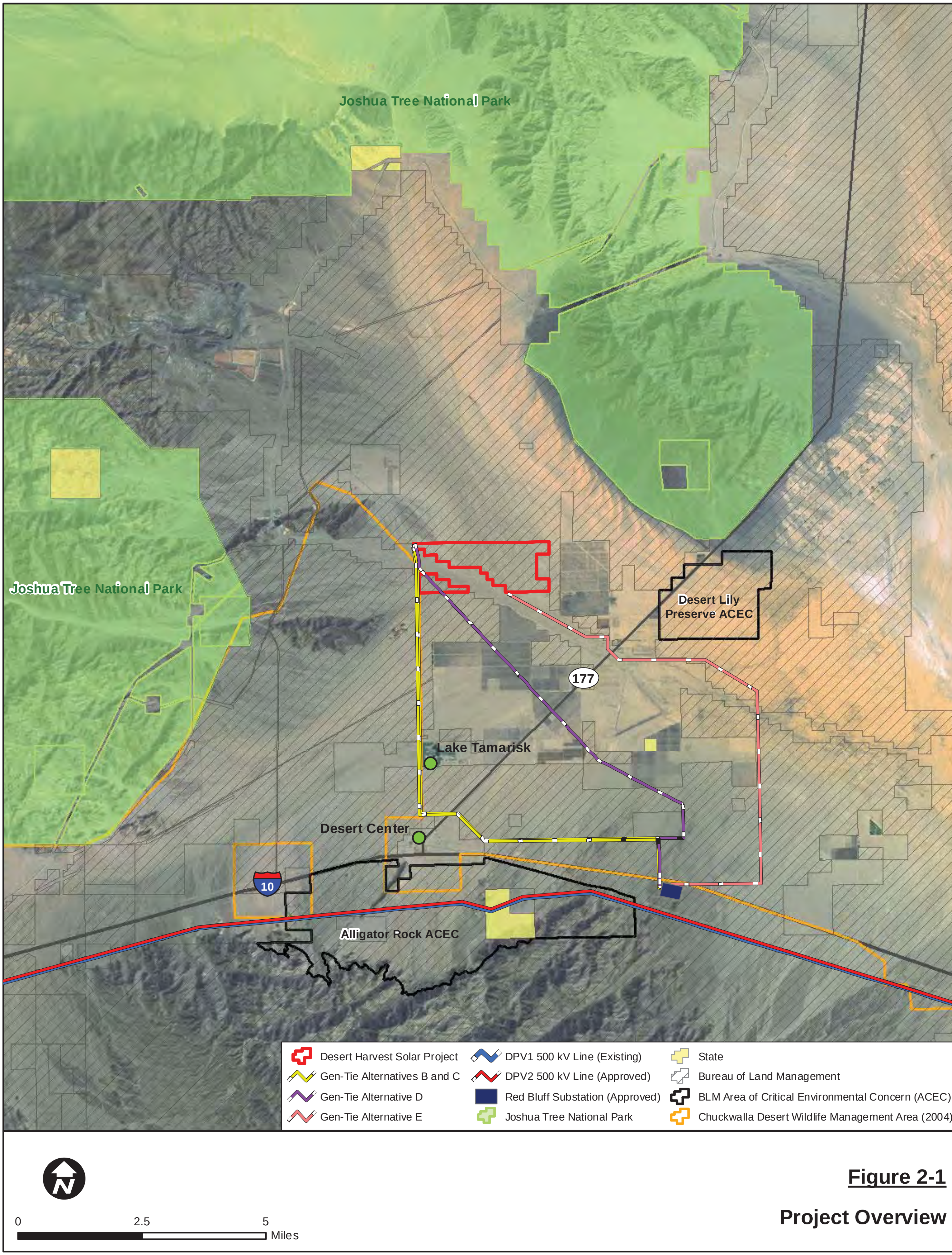


Figure 2-1

Project Overview

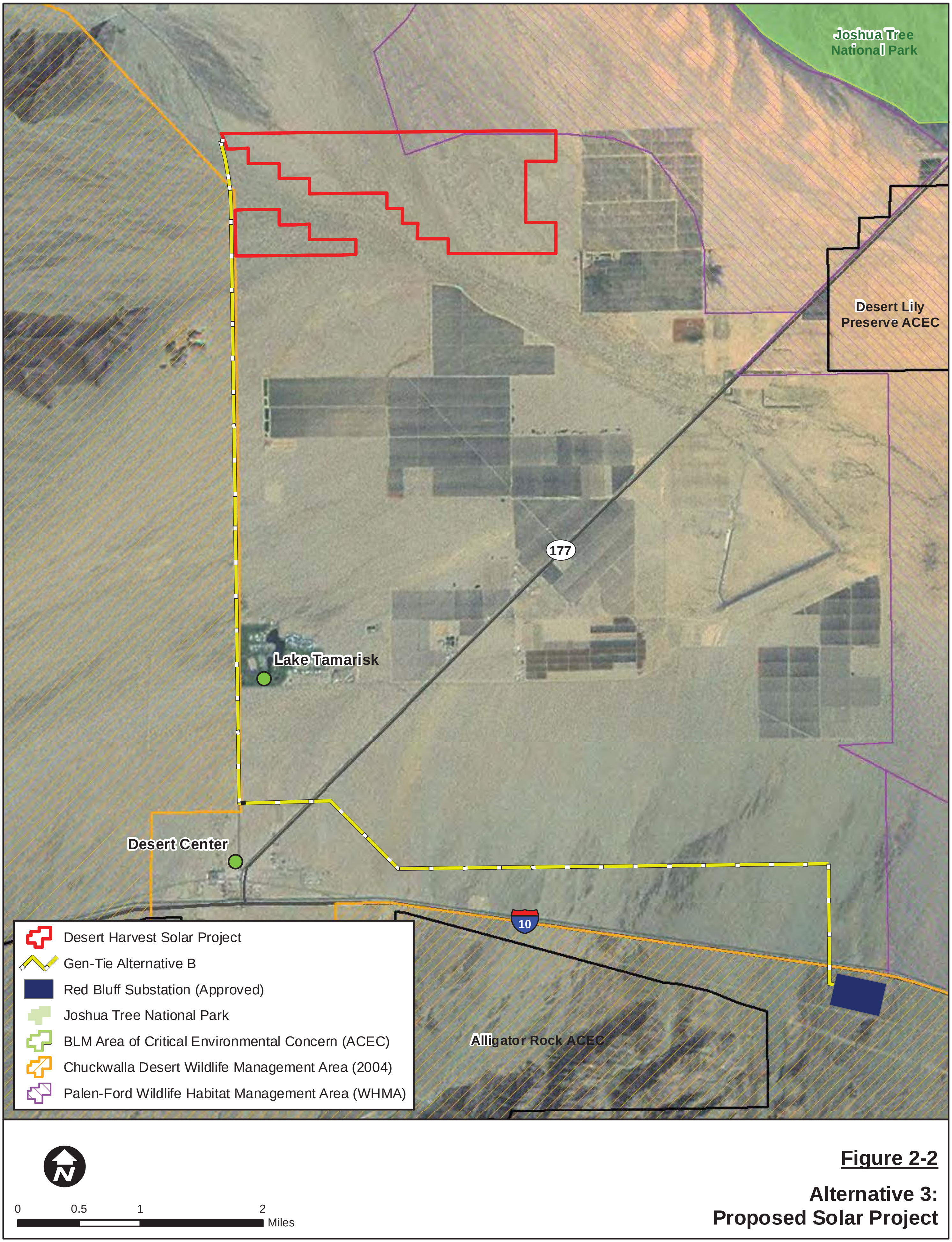
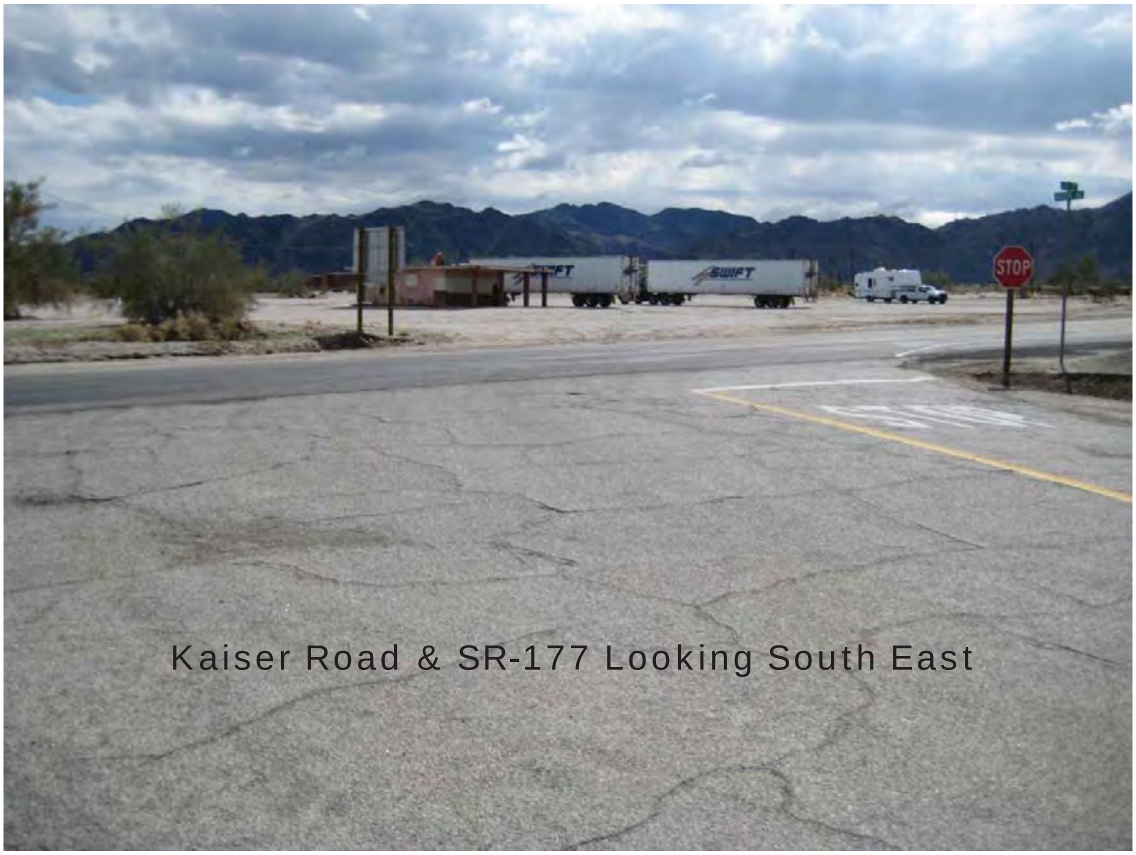


Figure 2-2

Alternative 3:
Proposed Solar Project

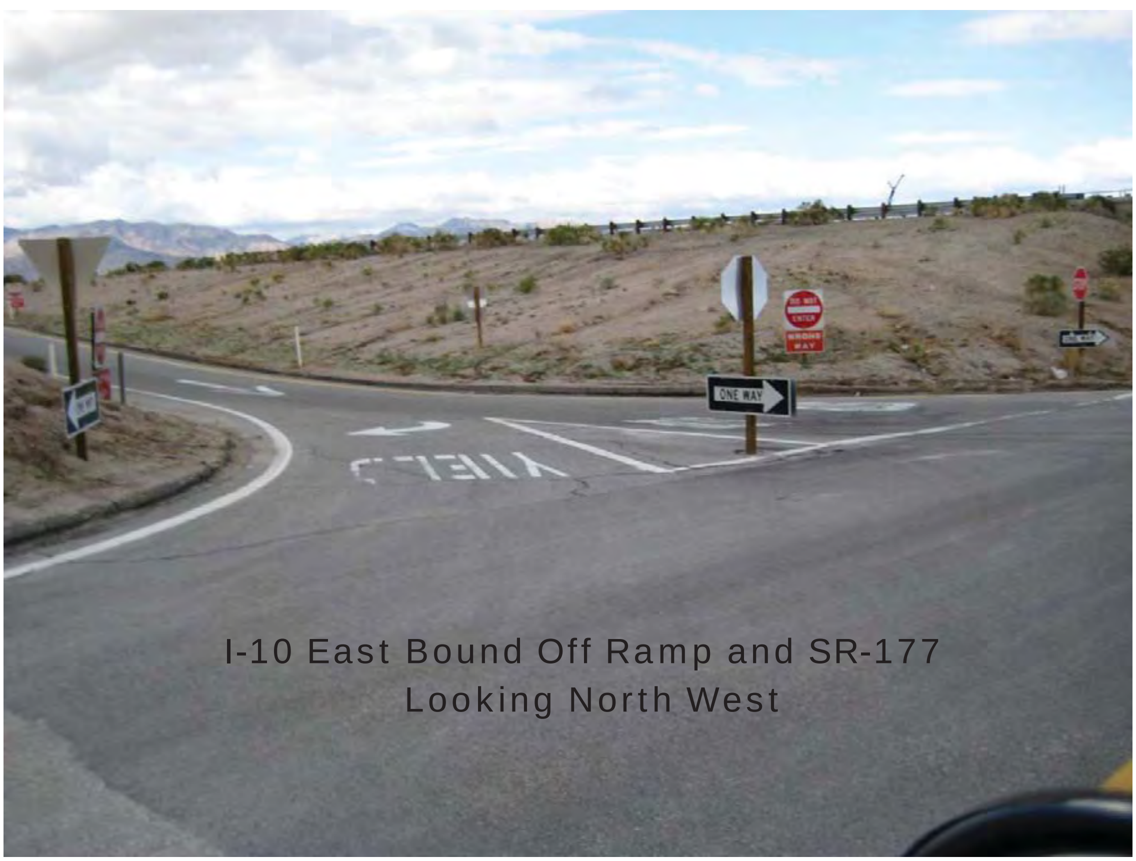


Kaiser Road & SR-177 Looking South East

Kaiser Road - One Mile North of SR-177
Looking North

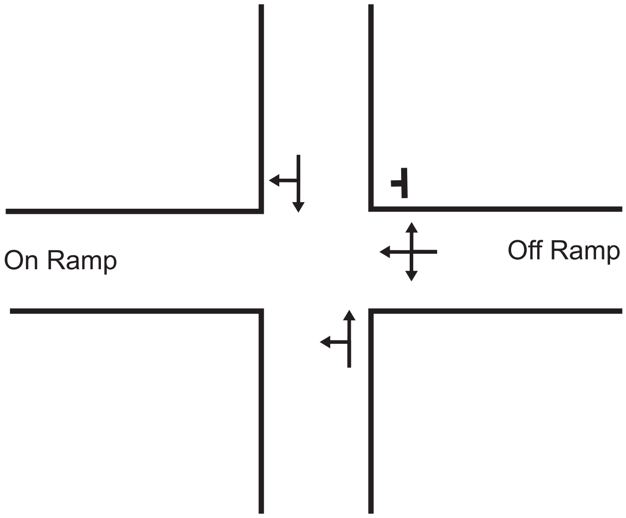
Photos by HKA
Figure 3

Kaiser Road at Project Location
Looking North

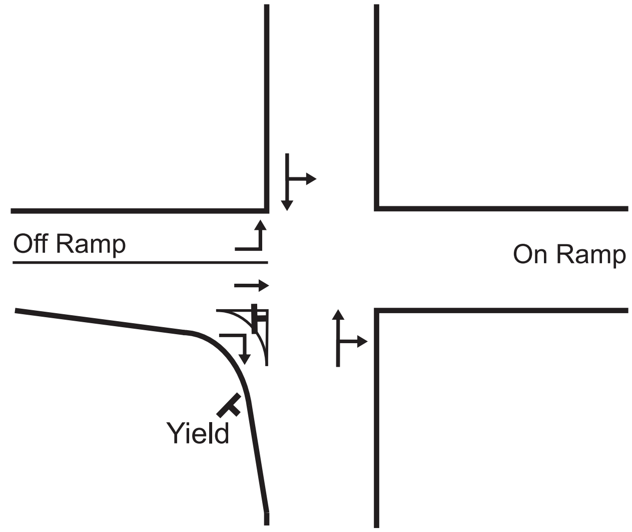


I-10 East Bound Off Ramp and SR-177
Looking North West

Photos by HKA
Figure

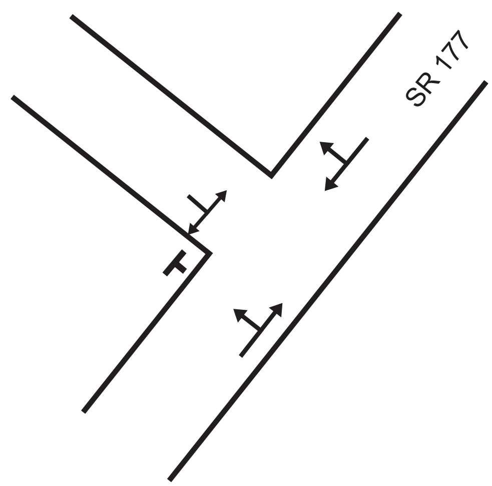


I-10 WEST BOUND (E-W)
and
STATE ROUTE 177 (N-S)



I-10 EASTBOUND (E-W)
AND
STATE ROUTE 177 (N-S)

NORTH
N.T.S.



KAISER ROAD (NW-SE)
AND
STATE ROUTE 177 (NE-SW)

Legend

Direction of Traffic

Stop Sign

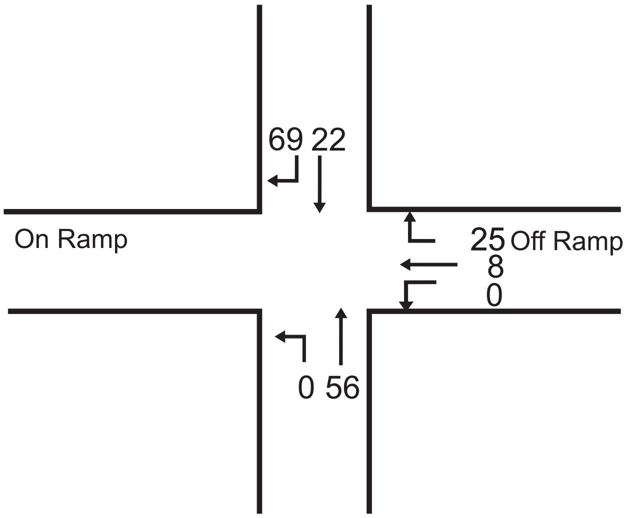
Hernandez, Kroone & Associates, Inc
- CONSULTING ENGINEERS -
PLANNING - DESIGN - SURVEYING
HKA
234 EAST DRAKE DRIVE
SAN BERNARDINO, CA 92408
(909) 884-3222 FAX (909) 383-1577
E-MAIL: richardh@hkagroup.com

DESCRIPTION

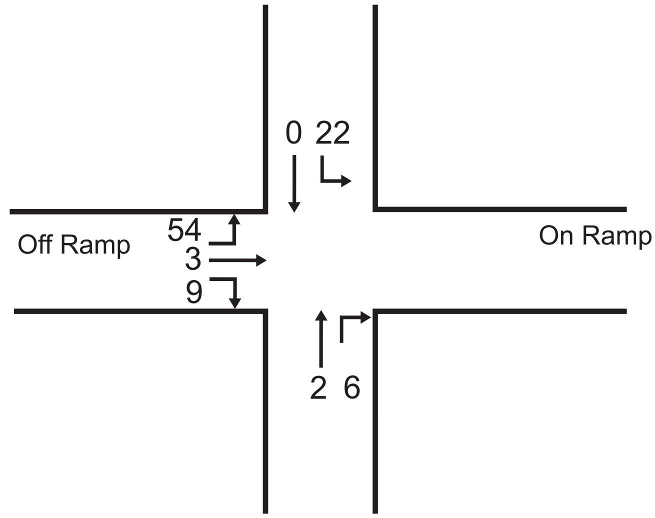
Existing Lane
Configurations
Figure 5

PROJECT NO.
11-1027

DATE
12-02-2011

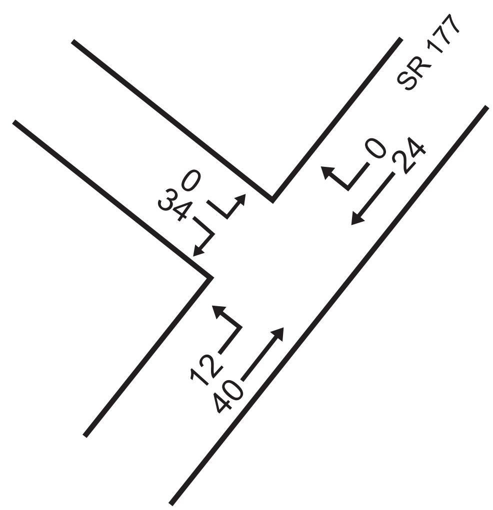


I-10 WEST BOUND (E-W)
and
STATE ROUTE 177 (N-S)



I-10 EASTBOUND (E-W)
AND
STATE ROUTE 177 (N-S)

NORTH
N.T.S.



KAISER ROAD (NW-SE)
AND
STATE ROUTE 177 (NE-SW)

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E-MAIL: richardh@hkagroup.com

DESCRIPTION

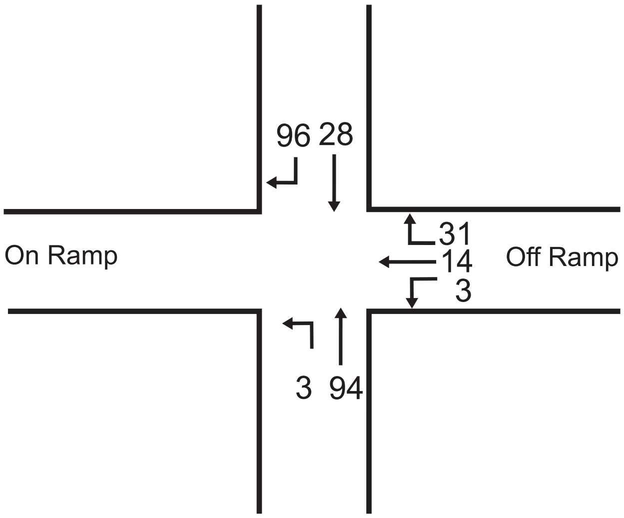
AM Existing Traffic
in PCEs
Figure 6A

PROJECT NO.

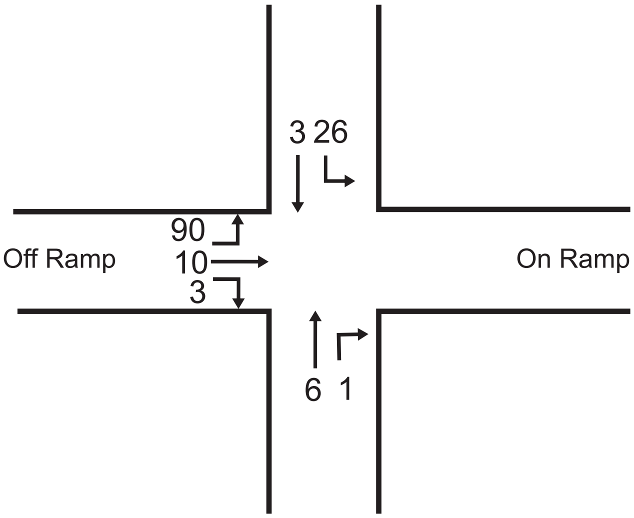
11-1027

DATE

1-23-2012

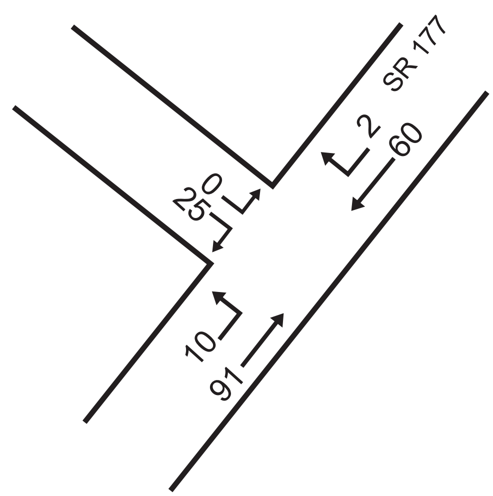


I-10 WEST BOUND (E-W)
and
STATE ROUTE 177 (N-S)



I-10 EASTBOUND (E-W)
AND
STATE ROUTE 177 (N-S)

NORTH
N.T.S.



KAISER ROAD (NW-SE)
AND
STATE ROUTE 177 (NE-SW)

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E-MAIL: richardh@hkagroup.com

DESCRIPTION
PM Existing Traffic,
in PCEs
Figure 6B

PROJECT NO.
11-1027

DATE
1-23-2012

official, scenic highway in accordance with the California State Scenic Highway Program.

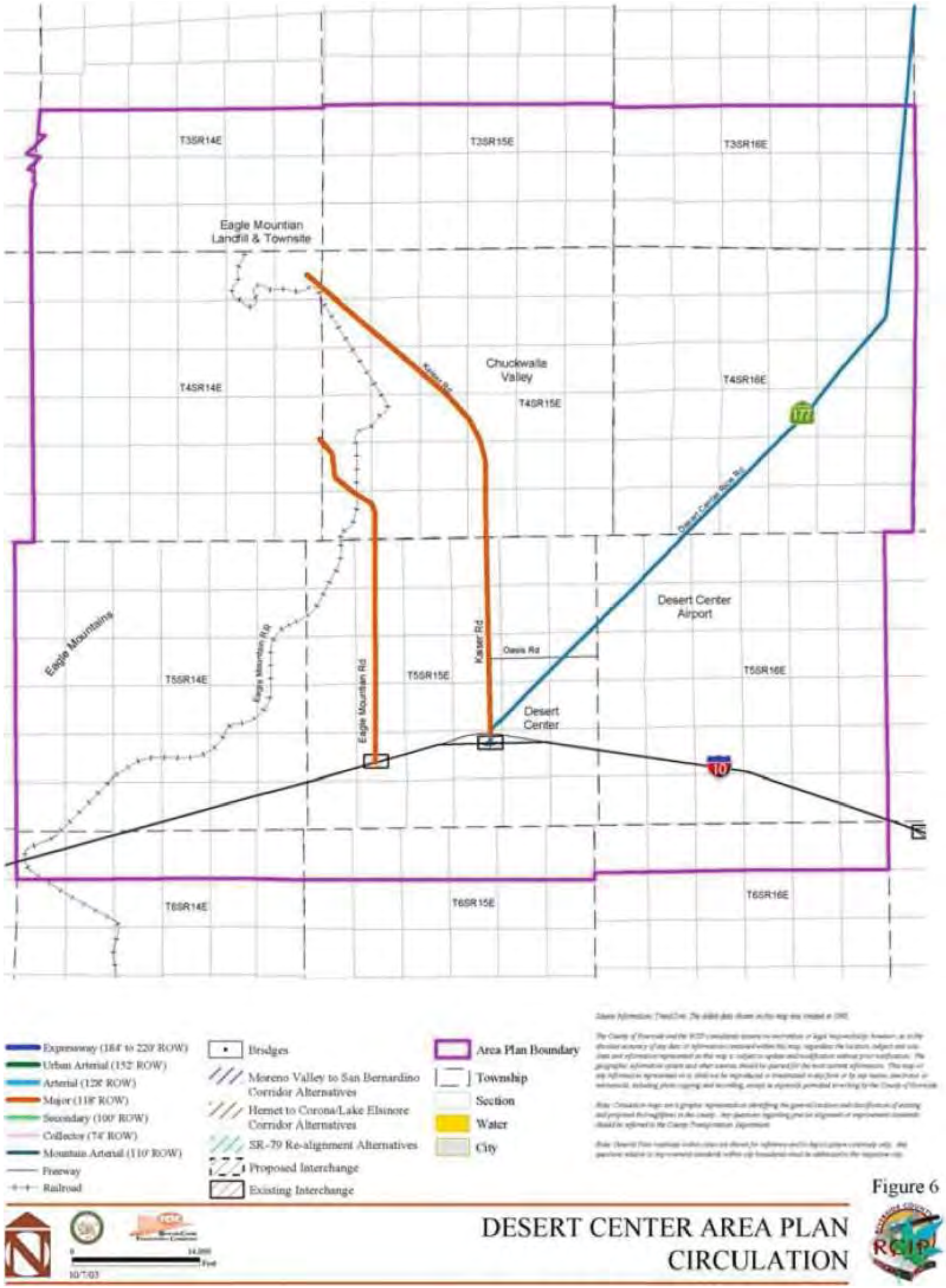
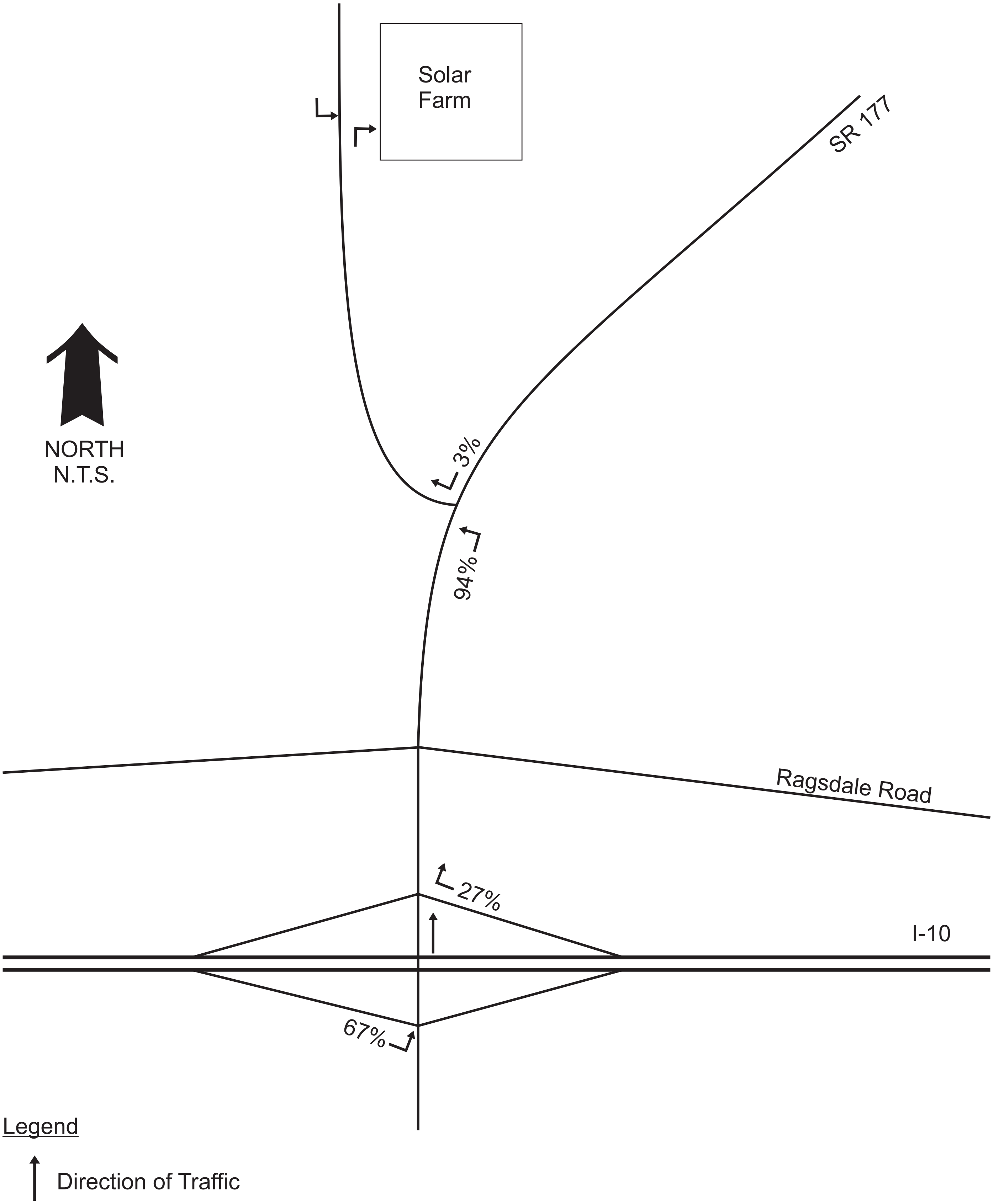


Figure 7: Trails and Bikeway System

Figure 7 Circulation County of Riverside



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DESCRIPTION

Project Trip Distribution, %

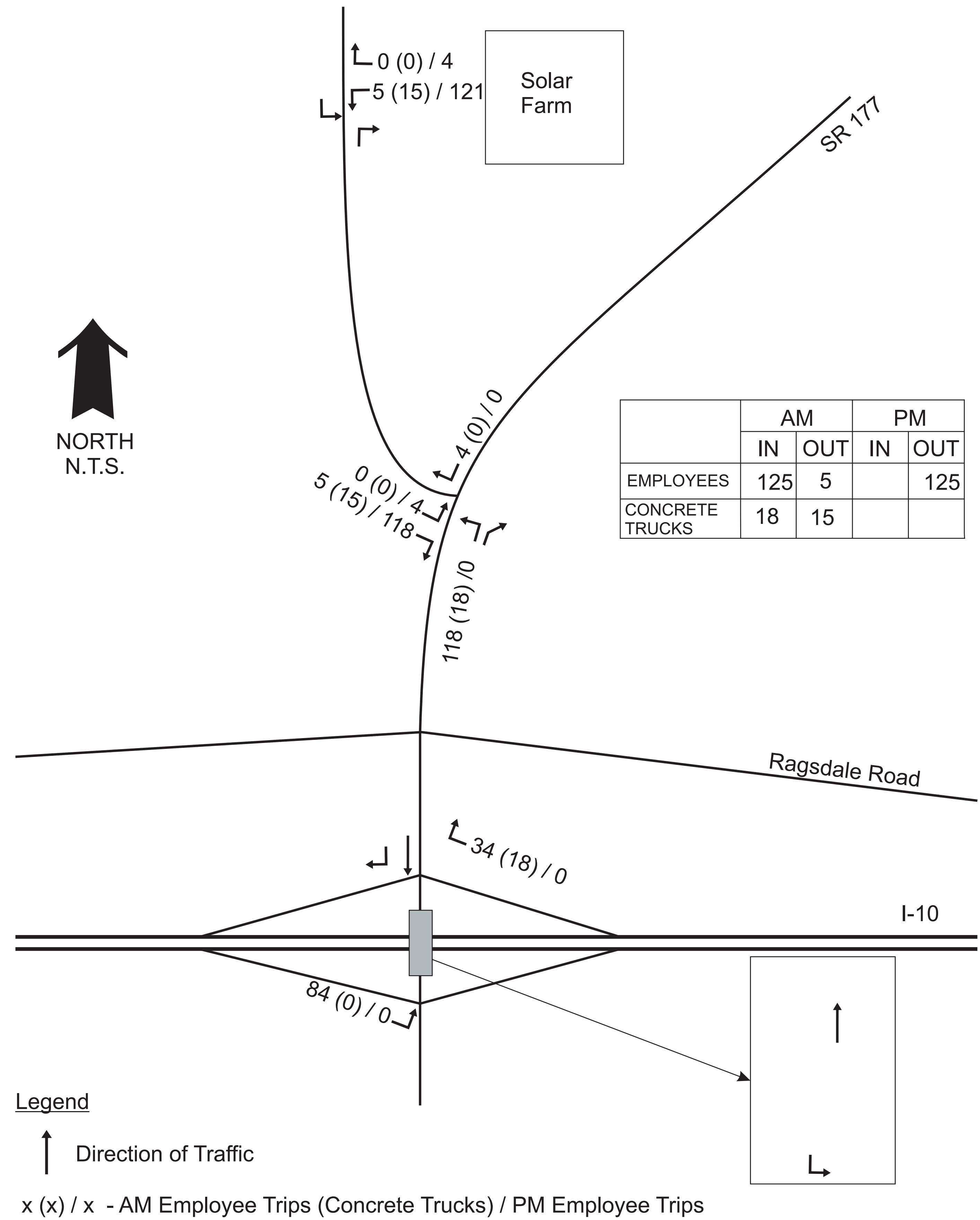
Figure 8

PROJECT NO.

11-1027

DATE

11-23-2011



	AM		PM	
	IN	OUT	IN	OUT
EMPLOYEES	125	5		125
CONCRETE TRUCKS	18	15		

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PLANNING - DESIGN - SURVEYING
HKA
234 EAST DRAKE DRIVE
SAN BERNARDINO, CA 92408
(909) 884-3222 FAX (909) 383-1577
E-MAIL: richardh@hkagroup.com

DESCRIPTION

Project Trip Distribution, PCEs

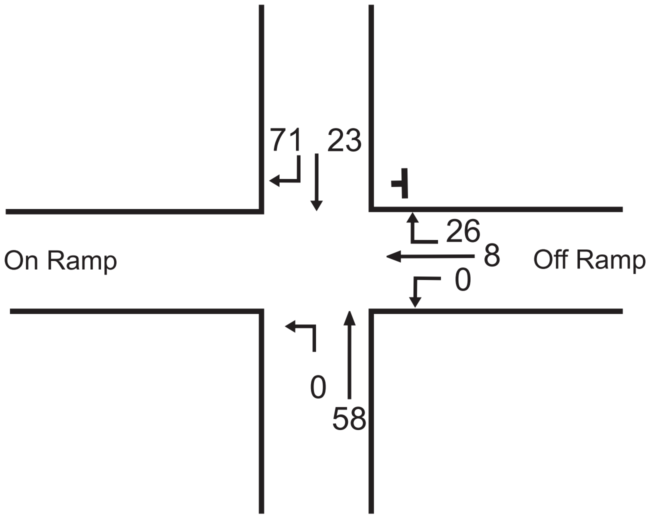
Figure 9

PROJECT NO.

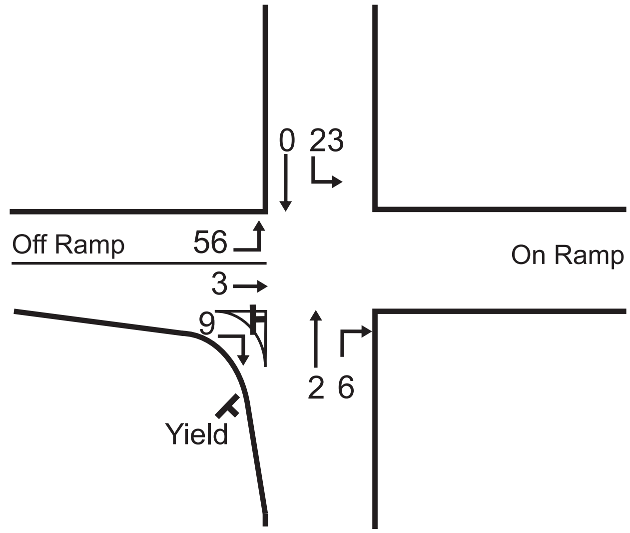
11-1027

DATE

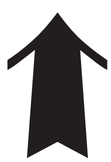
1-21-2012



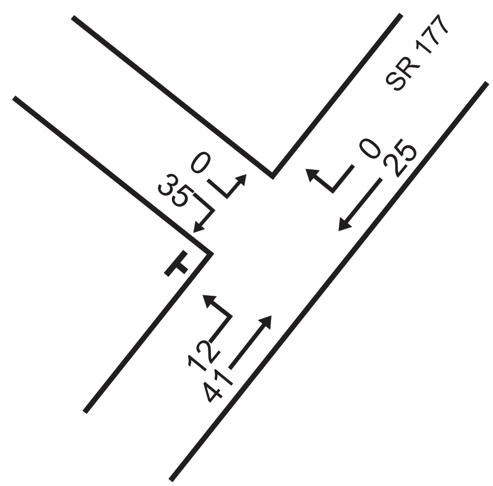
I-10 WEST BOUND (E-W)
and
STATE ROUTE 177 (N-S)



I-10 EASTBOUND (E-W)
AND
STATE ROUTE 177 (N-S)



NORTH
N.T.S.



KAISER ROAD (NW-SE)
AND
STATE ROUTE 177 (NE-SW)

Legend

Direction of Traffic

Stop Sign

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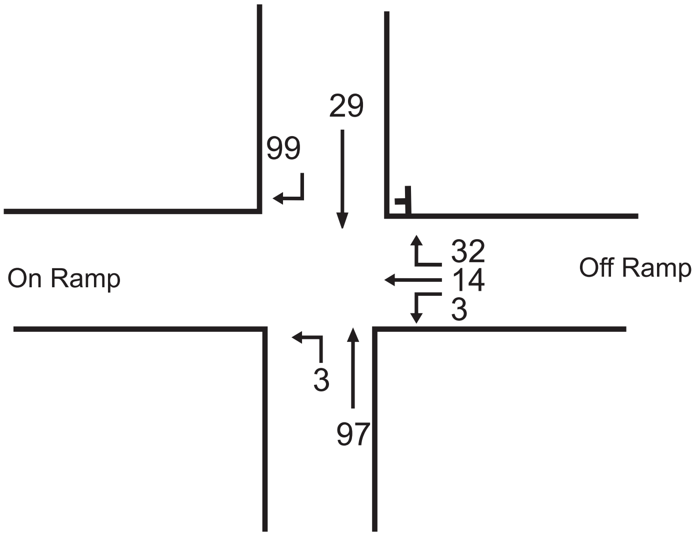
E-MAIL: richardh@hkagroup.com

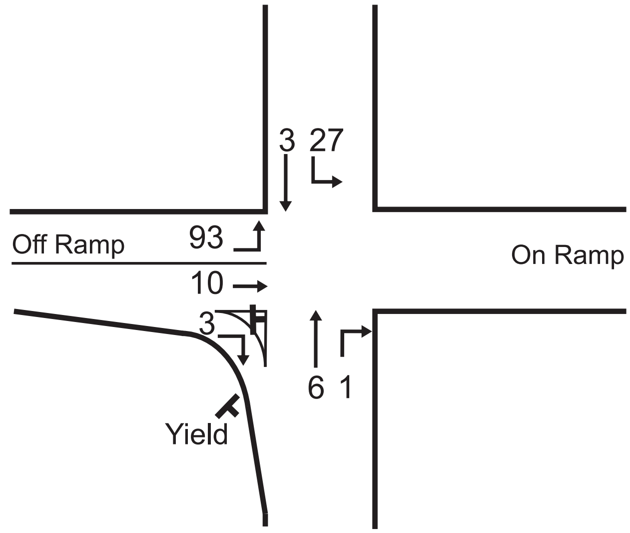
DESCRIPTION
AM Background Traffic adjusted for Construction Period wo/Project
Figure 10A

PROJECT NO.
11-1027

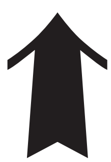
DATE
1-23-2012



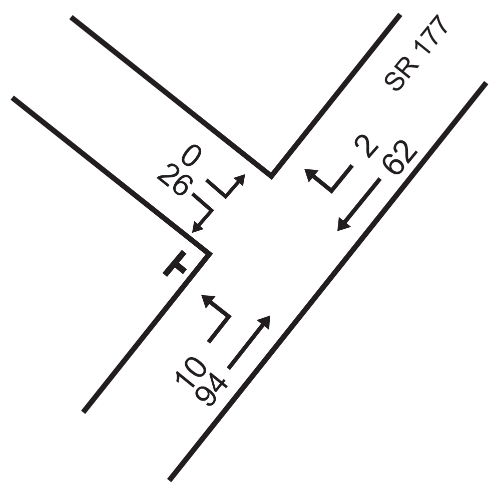
I-10 WEST BOUND (E-W)
and
STATE ROUTE 177 (N-S)



I-10 EASTBOUND (E-W)
AND
STATE ROUTE 177 (N-S)



NORTH
N.T.S.



KAISER ROAD (NW-SE)
AND
STATE ROUTE 177 (NE-SW)

Legend

Direction of Traffic

Stop Sign

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234 EAST DRAKE DRIVE
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DESCRIPTION

PM Background Traffic Adjusted for Construction Period wo/Project

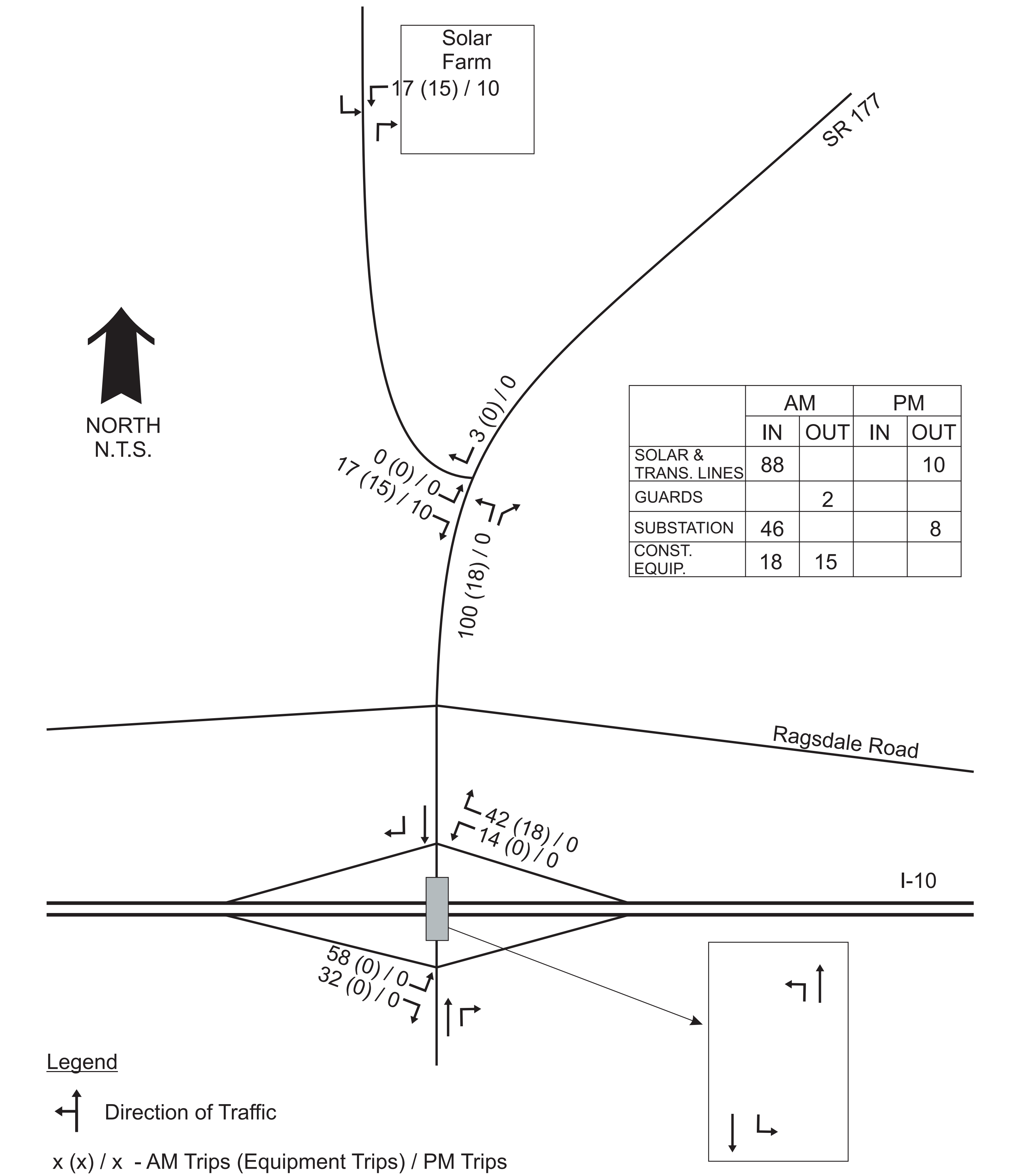
Figure 10B

PROJECT NO.

11-1027

DATE

1-23-2012



	AM		PM	
	IN	OUT	IN	OUT
SOLAR & TRANS. LINES	88			10
GUARDS		2		
SUBSTATION	46			8
CONST. EQUIP.	18	15		

Hernandez, Kroone & Associates, Inc

- CONSULTING ENGINEERS -

PLANNING - DESIGN - SURVEYING

HKA

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SAN BERNARDINO, CA 92408
(909) 884-3222 FAX (909) 383-1577
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DESCRIPTION

Desert Sunlight Solar Farm

Project Trips

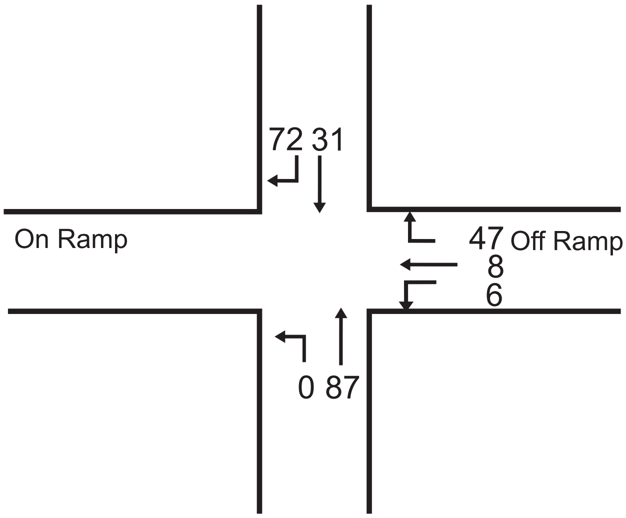
Figure 11

PROJECT NO.

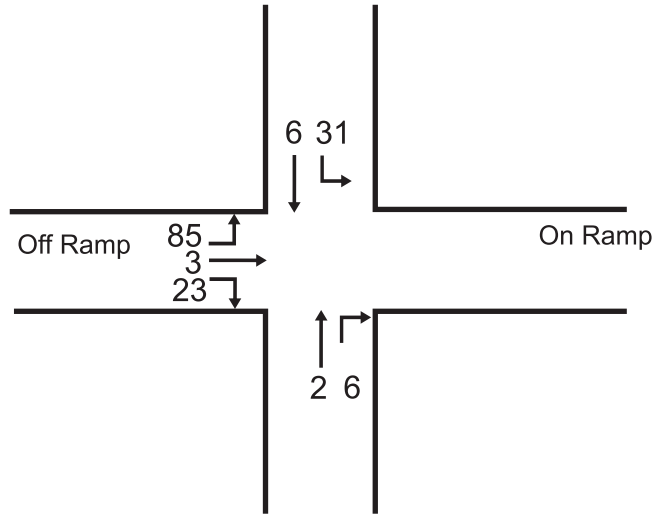
11-1027

DATE

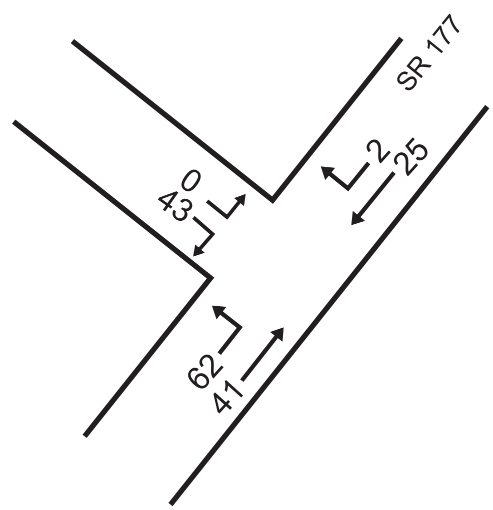
12-02-2011



I-10 WEST BOUND (E-W)
and
STATE ROUTE 177 (N-S)



I-10 EASTBOUND (E-W)
AND
STATE ROUTE 177 (N-S)



KAISER ROAD (NW-SE)
AND
STATE ROUTE 177 (NE-SW)

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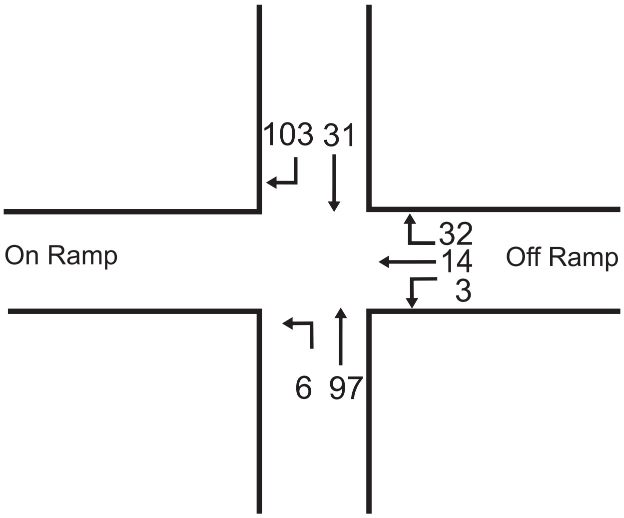
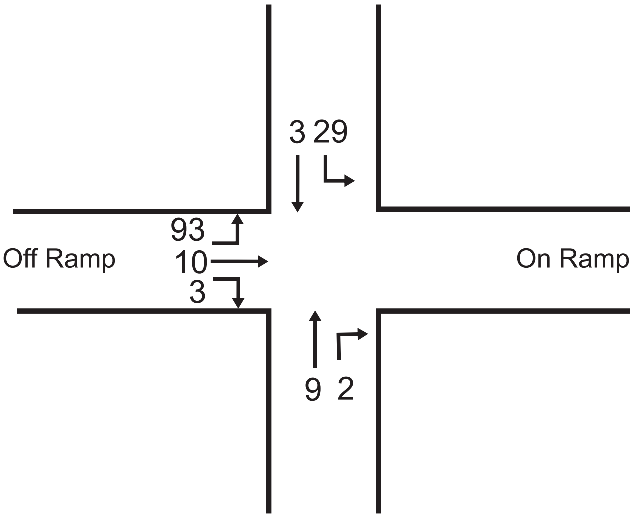
DESCRIPTION	PROJECT NO.
AM Background with Cumulative Traffic Volumes, in PCEs Figure 12A	11-1027
	DATE 1-23-2012

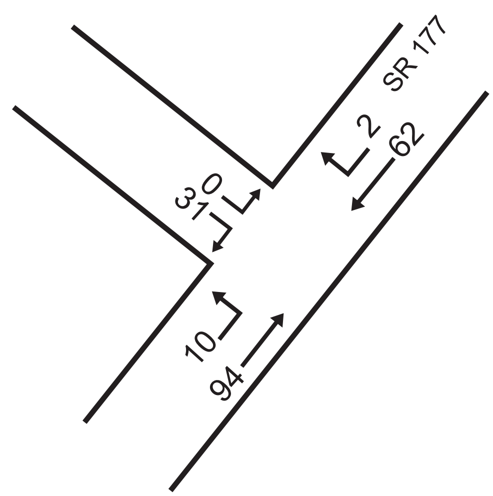


I-10 WEST BOUND (E-W)
and
STATE ROUTE 177 (N-S)



I-10 EASTBOUND (E-W)
AND
STATE ROUTE 177 (N-S)

NORTH
N.T.S.



KAISER ROAD (NW-SE)
AND
STATE ROUTE 177 (NE-SW)

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DESCRIPTION
PM Background with Cumulative
Traffic Volumes,
in PCEs
Figure 12B

PROJECT NO.
11-1027

DATE
1-23-2012

Appendix C
LOS Analysis

- Existing – AM & PM
- Construction Years without Project - AM & PM
- Construction Years with Project - AM & PM
- Construction and Cumulative Project without Project - AM & PM
- Construction and Cumulative Project with Project - AM & PM

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*NJC*	Intersection	*SR-177 / I-10 EB Off Ramp*
Agency/Co.	*Hernandez, Kroone & Associates*	Jurisdiction	
Date Performed	*1/23/2012*	Analysis Year	*Existing*
Analysis Time Period	*AM*		
Project Description *11-1027*			
East/West Street: *I-10 EB Off Ramp*		North/South Street: *SR-177*	
Intersection Orientation: *North-South*		Study Period (hrs): *0.25*	

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*2*	*6*	*22*	*0*	*0*
Peak-Hour Factor, PHF	*0.83*	*0.83*	*0.83*	*0.83*	*0.83*	*0.83*
Hourly Flow Rate, HFR	*0*	*2*	*7*	*26*	*0*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*0*	*54*	*3*	*9*
Peak-Hour Factor, PHF	*0.83*	*0.83*	*0.83*	*0.83*	*0.83*	*0.83*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*65*	*3*	*10*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*1*
Lanes	*0*	*0*	*0*	*1*	*1*	*1*
Configuration				*L*	*T*	*R*

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*				*L*	*T*	*R*
v (vph)		*26*				*65*	*3*	*10*
C (m) (vph)		*1624*				*939*	*821*	*1091*
v/c		*0.02*				*0.07*	*0.00*	*0.01*
95% queue length		*0.05*				*0.22*	*0.01*	*0.03*
Control Delay		*7.3*				*9.1*	*9.4*	*8.3*
LOS		*A*				*A*	*A*	*A*
Approach Delay	--	--				*9.0*		
Approach LOS	--	--				*A*		

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	NJC	Intersection	SR-177 / I-10 EB Off Ramp
Agency/Co.	Hernandez, Kroone & Associates	Jurisdiction	
Date Performed	1/23/2012	Analysis Year	Existing
Analysis Time Period	PM		
Project Description	11-1027		
East/West Street:	I-10 EB Off Ramp	North/South Street:	SR-177
Intersection Orientation:	North-South	Study Period (hrs):	0.25

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	0	6	1	26	3	0
Peak-Hour Factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Hourly Flow Rate, HFR	0	6	1	26	3	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration			TR	LT		
Upstream Signal		0			0	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	0	0	0	90	10	3
Peak-Hour Factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Hourly Flow Rate, HFR	0	0	0	92	10	3
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			1
Lanes	0	0	0	1	1	1
Configuration				L	T	R

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT				L	T	R
v (vph)		26				92	10	3
C (m) (vph)		1627				935	820	1087
v/c		0.02				0.10	0.01	0.00
95% queue length		0.05				0.33	0.04	0.01
Control Delay		7.2				9.3	9.4	8.3
LOS		A				A	A	A
Approach Delay	--	--				9.3		
Approach LOS	--	--				A		

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*NJC*	Intersection	*SR-177 / I-10 WB OFF RAMP*
Agency/Co.	*HERNANDEZ KROONE & ASSOCIATES*	Jurisdiction	
Date Performed	*1/23/2012*	Analysis Year	*EXISTING*
Analysis Time Period	*AM*		

Project Description *11-1027*	
East/West Street: *I-10 WB OFF RAMP*	North/South Street: *SR-177*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*56*	*0*	*0*	*22*	*69*
Peak-Hour Factor, PHF	*0.81*	*0.81*	*0.81*	*0.81*	*0.81*	*0.81*
Hourly Flow Rate, HFR	*0*	*69*	*0*	*0*	*27*	*85*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	
Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*8*	*25*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.81*	*0.81*	*0.81*	*0.81*	*0.81*	*0.81*
Hourly Flow Rate, HFR	*0*	*9*	*30*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*0*	*0*
Configuration		*LTR*				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*			*LTR*				
v (vph)	*0*			*39*				
C (m) (vph)	*1490*			*917*				
v/c	*0.00*			*0.04*				
95% queue length	*0.00*			*0.13*				
Control Delay	*7.4*			*9.1*				
LOS	*A*			*A*				
Approach Delay	--	--	*9.1*					
Approach LOS	--	--	*A*					

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*NJC*	Intersection	*SR-177 / I-10 WB OFF RAMP*
Agency/Co.	*HERNANDEZ KROONE & ASSOCIATES*	Jurisdiction	
Date Performed	*1/23/2012*	Analysis Year	*EXISTING*
Analysis Time Period	*PM*		

Project Description	*11-1027*		
East/West Street:	*I-10 WB OFF RAMP*	North/South Street:	*SR-177*
Intersection Orientation:	*North-South*	Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*3*	*94*	*0*	*0*	*28*	*96*
Peak-Hour Factor, PHF	*0.85*	*0.85*	*0.85*	*0.85*	*0.85*	*0.85*
Hourly Flow Rate, HFR	*3*	*110*	*0*	*0*	*32*	*112*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*3*	*14*	*31*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.85*	*0.85*	*0.85*	*0.85*	*0.85*	*0.85*
Hourly Flow Rate, HFR	*3*	*16*	*36*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*0*	*0*
Configuration		*LTR*				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*			*LTR*				
v (vph)	*3*			*55*				
C (m) (vph)	*1451*			*827*				
v/c	*0.00*			*0.07*				
95% queue length	*0.01*			*0.21*				
Control Delay	*7.5*			*9.7*				
LOS	*A*			*A*				
Approach Delay	--	--	*9.7*					
Approach LOS	--	--	*A*					

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*NJC*	Intersection	*SR-177 / KAISER ROAD*
Agency/Co.	*HERNANDEZ, KROONE & ASSOCIATES*	Jurisdiction	
Date Performed	*1/23/2012*	Analysis Year	*Existing*
Analysis Time Period	*AM*		
Project Description	*11-1027*		
East/West Street:	*KAISER ROAD*	North/South Street:	*SR-177*
Intersection Orientation:	*North-South*	Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*12*	*40*	*0*	*0*	*24*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*13*	*44*	*0*	*0*	*26*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*0*	*0*	*0*	*34*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*0*	*0*	*37*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (vph)	*13*						*37*	
C (m) (vph)	*1601*						*1056*	
v/c	*0.01*						*0.04*	
95% queue length	*0.02*						*0.11*	
Control Delay	*7.3*						*8.5*	
LOS	*A*						*A*	
Approach Delay	--	--				*8.5*		
Approach LOS	--	--				*A*		

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*NJC*	Intersection	*SR-177 / KAISER ROAD*
Agency/Co.	*HERNANDEZ, KROONE & ASSOCIATES*	Jurisdiction	
Date Performed	*1/23/2012*	Analysis Year	*EXISTING*
Analysis Time Period	*PM*		

Project Description	*11-1027*		
East/West Street:	*KAISER ROAD*	North/South Street:	*SR-177*
Intersection Orientation:	*North-South*	Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*10*	*91*	*0*	*0*	*60*	*2*
Peak-Hour Factor, PHF	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*
Hourly Flow Rate, HFR	*13*	*121*	*0*	*0*	*80*	*2*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*0*	*0*	*0*	*25*
Peak-Hour Factor, PHF	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*0*	*0*	*33*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (vph)	*13*						*33*	
C (m) (vph)	*1528*						*985*	
v/c	*0.01*						*0.03*	
95% queue length	*0.03*						*0.10*	
Control Delay	*7.4*						*8.8*	
LOS	*A*						*A*	
Approach Delay	--	--				*8.8*		
Approach LOS	--	--				*A*		

HCS2000™ Version 4.1f

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*NJC*	Intersection	*SR-177 / I-10 EB Off Ramp*
Agency/Co.	*Hernandez, Kroone & Associates*	Jurisdiction	
Date Performed	*12/2/2011*	Analysis Year	*Const w/o Project*
Analysis Time Period	*AM*		
Project Description *11-1027*			
East/West Street: *I-10 EB Off Ramp*		North/South Street: *SR-177*	
Intersection Orientation: *North-South*		Study Period (hrs): *0.25*	

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*2*	*6*	*23*	*0*	*0*
Peak-Hour Factor, PHF	*0.83*	*0.83*	*0.83*	*0.83*	*0.83*	*0.83*
Hourly Flow Rate, HFR	*0*	*2*	*7*	*27*	*0*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*0*	*56*	*3*	*9*
Peak-Hour Factor, PHF	*0.83*	*0.83*	*0.83*	*0.83*	*0.83*	*0.83*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*67*	*3*	*10*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*1*
Lanes	*0*	*0*	*0*	*1*	*1*	*1*
Configuration				*L*	*T*	*R*

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*				*L*	*T*	*R*
v (vph)		*27*				*67*	*3*	*10*
C (m) (vph)		*1624*				*936*	*818*	*1091*
v/c		*0.02*				*0.07*	*0.00*	*0.01*
95% queue length		*0.05*				*0.23*	*0.01*	*0.03*
Control Delay		*7.3*				*9.1*	*9.4*	*8.3*
LOS		*A*				*A*	*A*	*A*
Approach Delay	--	--				*9.1*		
Approach LOS	--	--				*A*		

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*NJC*	Intersection	*SR-177 / I-10 EB Off Ramp*
Agency/Co.	*Hernandez, Kroone & Associates*	Jurisdiction	
Date Performed	*12/2/2011*	Analysis Year	*Construction w/o Project*
Analysis Time Period	*PM*		
Project Description *11-1027*			
East/West Street: *I-10 EB Off Ramp*		North/South Street: *SR-177*	
Intersection Orientation: *North-South*		Study Period (hrs): *0.25*	

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*6*	*1*	*27*	*3*	*0*
Peak-Hour Factor, PHF	*0.97*	*0.97*	*0.97*	*0.97*	*0.97*	*0.97*
Hourly Flow Rate, HFR	*0*	*6*	*1*	*27*	*3*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*0*	*93*	*10*	*3*
Peak-Hour Factor, PHF	*0.97*	*0.97*	*0.97*	*0.97*	*0.97*	*0.97*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*95*	*10*	*3*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*1*
Lanes	*0*	*0*	*0*	*1*	*1*	*1*
Configuration				*L*	*T*	*R*

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*				*L*	*T*	*R*
v (vph)		*27*				*95*	*10*	*3*
C (m) (vph)		*1627*				*932*	*817*	*1087*
v/c		*0.02*				*0.10*	*0.01*	*0.00*
95% queue length		*0.05*				*0.34*	*0.04*	*0.01*
Control Delay		*7.2*				*9.3*	*9.5*	*8.3*
LOS		*A*				*A*	*A*	*A*
Approach Delay	--	--				*9.3*		
Approach LOS	--	--				*A*		

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*NJC*	Intersection	*SR-177 / I-10 WB OFF RAMP*
Agency/Co.	*HERNANDEZ KROONE & ASSOCIATES*	Jurisdiction	
Date Performed	*12/2/2011*	Analysis Year	*Const wo Project Trips*
Analysis Time Period	*AM*		

Project Description *11-1027*	
East/West Street: *I-10 WB OFF RAMP*	North/South Street: *SR-177*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*58*	*0*	*0*	*23*	*71*
Peak-Hour Factor, PHF	*0.81*	*0.81*	*0.81*	*0.81*	*0.81*	*0.81*
Hourly Flow Rate, HFR	*0*	*71*	*0*	*0*	*28*	*87*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*8*	*26*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.81*	*0.81*	*0.81*	*0.81*	*0.81*	*0.81*
Hourly Flow Rate, HFR	*0*	*9*	*32*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*0*	*0*
Configuration		*LTR*				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*			*LTR*				
v (vph)	*0*			*41*				
C (m) (vph)	*1487*			*916*				
v/c	*0.00*			*0.04*				
95% queue length	*0.00*			*0.14*				
Control Delay	*7.4*			*9.1*				
LOS	*A*			*A*				
Approach Delay	--	--		*9.1*				
Approach LOS	--	--		*A*				

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*NJC*	Intersection	*SR-177 / I-10 WB OFF RAMP*
Agency/Co.	*HERNANDEZ KROONE & ASSOCIATES*	Jurisdiction	
Date Performed	*12/2/2011*	Analysis Year	*Construction wo Project*
Analysis Time Period	*PM*		
Project Description *11-1027*			
East/West Street: *I-10 WB OFF RAMP*		North/South Street: *SR-177*	
Intersection Orientation: *North-South*		Study Period (hrs): *0.25*	

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*3*	*97*	*0*	*0*	*29*	*99*
Peak-Hour Factor, PHF	*0.85*	*0.85*	*0.85*	*0.85*	*0.85*	*0.85*
Hourly Flow Rate, HFR	*3*	*114*	*0*	*0*	*34*	*116*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*3*	*14*	*32*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.85*	*0.85*	*0.85*	*0.85*	*0.85*	*0.85*
Hourly Flow Rate, HFR	*3*	*16*	*37*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*0*	*0*
Configuration		*LTR*				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*			*LTR*				
v (vph)	*3*			*56*				
C (m) (vph)	*1444*			*822*				
v/c	*0.00*			*0.07*				
95% queue length	*0.01*			*0.22*				
Control Delay	*7.5*			*9.7*				
LOS	*A*			*A*				
Approach Delay	--	--	*9.7*					
Approach LOS	--	--	*A*					

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*NJC*	Intersection	*SR-177 / KAISER ROAD*
Agency/Co.	*HERNANDEZ, KROONE & ASSOCIATES*	Jurisdiction	
Date Performed	*12/2/2011*	Analysis Year	*Const wo Project*
Analysis Time Period	*AM*		
Project Description *11-1027*			
East/West Street: *KAISER ROAD*		North/South Street: *SR-177*	
Intersection Orientation: *North-South*		Study Period (hrs): *0.25*	

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*12*	*41*	*0*	*0*	*25*	*0*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*13*	*45*	*0*	*0*	*27*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*0*	*0*	*0*	*35*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*0*	*0*	*38*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (vph)	*13*						*38*	
C (m) (vph)	*1600*						*1054*	
v/c	*0.01*						*0.04*	
95% queue length	*0.02*						*0.11*	
Control Delay	*7.3*						*8.5*	
LOS	*A*						*A*	
Approach Delay	--	--				*8.5*		
Approach LOS	--	--				*A*		

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	NJC	Intersection	SR-177 / KAISER ROAD
Agency/Co.	HERNANDEZ, KROONE & ASSOCIATES	Jurisdiction	
Date Performed	12/2/2011	Analysis Year	Construction wo Project
Analysis Time Period	PM		

Project Description	11-1027		
East/West Street:	KAISER ROAD	North/South Street:	SR-177
Intersection Orientation:	North-South	Study Period (hrs):	0.25

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	10	94	0	0	62	2
Peak-Hour Factor, PHF	0.75	0.75	0.75	0.75	0.75	0.75
Hourly Flow Rate, HFR	13	125	0	0	82	2
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	0	0	0	0	0	26
Peak-Hour Factor, PHF	0.75	0.75	0.75	0.75	0.75	0.75
Hourly Flow Rate, HFR	0	0	0	0	0	34
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LR	
v (vph)	13						34	
C (m) (vph)	1526						982	
v/c	0.01						0.03	
95% queue length	0.03						0.11	
Control Delay	7.4						8.8	
LOS	A						A	
Approach Delay	--	--				8.8		
Approach LOS	--	--				A		

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*NJC*	Intersection	*SR-177 / I-10 EB Off Ramp*
Agency/Co.	*Hernandez, Kroone & Associates*	Jurisdiction	
Date Performed	*1/23/2012*	Analysis Year	*Const with Project*
Analysis Time Period	*AM*		
Project Description *11-1027*			
East/West Street: *I-10 EB Off Ramp*		North/South Street: *SR-177*	
Intersection Orientation: *North-South*		Study Period (hrs): *0.25*	

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*2*	*6*	*41*	*0*	*0*
Peak-Hour Factor, PHF	*0.83*	*0.83*	*0.83*	*0.83*	*0.83*	*0.83*
Hourly Flow Rate, HFR	*0*	*2*	*7*	*49*	*0*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*0*	*140*	*3*	*9*
Peak-Hour Factor, PHF	*0.83*	*0.83*	*0.83*	*0.83*	*0.83*	*0.83*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*168*	*3*	*10*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*1*
Lanes	*0*	*0*	*0*	*1*	*1*	*1*
Configuration				*L*	*T*	*R*

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*				*L*	*T*	*R*
v (vph)		*49*				*168*	*3*	*10*
C (m) (vph)		*1624*				*872*	*763*	*1091*
v/c		*0.03*				*0.19*	*0.00*	*0.01*
95% queue length		*0.09*				*0.71*	*0.01*	*0.03*
Control Delay		*7.3*				*10.1*	*9.7*	*8.3*
LOS		*A*				*B*	*A*	*A*
Approach Delay	--	--				*10.0*		
Approach LOS	--	--				*B*		

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*NJC*	Intersection	*SR-177 / I-10 EB Off Ramp*
Agency/Co.	*Hernandez, Kroone & Associates*	Jurisdiction	
Date Performed	*1/23/2012*	Analysis Year	*Construction w Project*
Analysis Time Period	*PM*		
Project Description	*11-1027*		
East/West Street:	*I-10 EB Off Ramp*	North/South Street:	*SR-177*
Intersection Orientation:	*North-South*	Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*6*	*1*	*61*	*3*	*0*
Peak-Hour Factor, PHF	*0.97*	*0.97*	*0.97*	*0.97*	*0.97*	*0.97*
Hourly Flow Rate, HFR	*0*	*6*	*1*	*62*	*3*	*0*
Percent Heavy Vehicles	*0*	*--*	*--*	*0*	*--*	*--*
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*0*	*93*	*10*	*3*
Peak-Hour Factor, PHF	*0.97*	*0.97*	*0.97*	*0.97*	*0.97*	*0.97*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*95*	*10*	*3*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*1*
Lanes	*0*	*0*	*0*	*1*	*1*	*1*
Configuration				*L*	*T*	*R*

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*				*L*	*T*	*R*
v (vph)		*62*				*95*	*10*	*3*
C (m) (vph)		*1627*				*833*	*731*	*1087*
v/c		*0.04*				*0.11*	*0.01*	*0.00*
95% queue length		*0.12*				*0.38*	*0.04*	*0.01*
Control Delay		*7.3*				*9.9*	*10.0*	*8.3*
LOS		*A*				*A*	*A*	*A*
Approach Delay	--	--				*9.8*		
Approach LOS	--	--				*A*		

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*NJC*	Intersection	*SR-177 / I-10 WB OFF RAMP*
Agency/Co.	*HERNANDEZ KROONE & ASSOCIATES*	Jurisdiction	
Date Performed	*1/23/2012*	Analysis Year	*Const w Project Trips*
Analysis Time Period	*AM*		
Project Description	*11-1027*		
East/West Street:	*I-10 WB OFF RAMP*	North/South Street:	*SR-177*
Intersection Orientation:	*North-South*	Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*142*	*0*	*0*	*41*	*75*
Peak-Hour Factor, PHF	*0.81*	*0.81*	*0.81*	*0.81*	*0.81*	*0.81*
Hourly Flow Rate, HFR	*0*	*175*	*0*	*0*	*50*	*92*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*8*	*78*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.81*	*0.81*	*0.81*	*0.81*	*0.81*	*0.81*
Hourly Flow Rate, HFR	*0*	*9*	*96*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*0*	*0*
Configuration		*LTR*				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*			*LTR*				
v (vph)	*0*			*105*				
C (m) (vph)	*1453*			*841*				
v/c	*0.00*			*0.12*				
95% queue length	*0.00*			*0.43*				
Control Delay	*7.5*			*9.9*				
LOS	*A*			*A*				
Approach Delay	--	--		*9.9*				
Approach LOS	--	--		*A*				

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*NJC*	Intersection	*SR-177 / I-10 WB OFF RAMP*
Agency/Co.	*HERNANDEZ KROONE & ASSOCIATES*	Jurisdiction	
Date Performed	*1/23/2012*	Analysis Year	*Construction w Project*
Analysis Time Period	*PM*		

Project Description *11-1027*	
East/West Street: *I-10 WB OFF RAMP*	North/South Street: *SR-177*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*3*	*97*	*0*	*0*	*63*	*183*
Peak-Hour Factor, PHF	*0.85*	*0.85*	*0.85*	*0.85*	*0.85*	*0.85*
Hourly Flow Rate, HFR	*3*	*114*	*0*	*0*	*74*	*215*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*3*	*14*	*32*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.85*	*0.85*	*0.85*	*0.85*	*0.85*	*0.85*
Hourly Flow Rate, HFR	*3*	*16*	*37*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*0*	*0*
Configuration		*LTR*				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*			*LTR*				
v (vph)	*3*			*56*				
C (m) (vph)	*1284*			*762*				
v/c	*0.00*			*0.07*				
95% queue length	*0.01*			*0.24*				
Control Delay	*7.8*			*10.1*				
LOS	*A*			*B*				
Approach Delay	--	--	*10.1*					
Approach LOS	--	--	*B*					

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	NJC	Intersection	SR-177 / KAISER ROAD
Agency/Co.	HERNANDEZ, KROONE & ASSOCIATES	Jurisdiction	
Date Performed	1/23/2012	Analysis Year	Construction w Project
Analysis Time Period	AM		
Project Description	11-1027		
East/West Street:	KAISER ROAD	North/South Street:	SR-177
Intersection Orientation:	North-South	Study Period (hrs):	0.25

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	148	41	0	0	25	4
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	164	45	0	0	27	4
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	0	0	0	0	0	55
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	0	0	0	0	0	61
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LR	
v (vph)	164						61	
C (m) (vph)	1595						1052	
v/c	0.10						0.06	
95% queue length	0.34						0.18	
Control Delay	7.5						8.6	
LOS	A						A	
Approach Delay	--	--				8.6		
Approach LOS	--	--				A		

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*NJC*	Intersection	*SR-177 / KAISER ROAD*
Agency/Co.	*HERNANDEZ, KROONE & ASSOCIATES*	Jurisdiction	
Date Performed	*1/23/2012*	Analysis Year	*Construction w Project*
Analysis Time Period	*PM*		
Project Description	*11-1027*		
East/West Street:	*KAISER ROAD*	North/South Street:	*SR-177*
Intersection Orientation:	*North-South*	Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*10*	*94*	*0*	*0*	*62*	*2*
Peak-Hour Factor, PHF	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*
Hourly Flow Rate, HFR	*13*	*125*	*0*	*0*	*82*	*2*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*0*	*4*	*0*	*144*
Peak-Hour Factor, PHF	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*5*	*0*	*192*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (vph)	*13*						*197*	
C (m) (vph)	*1526*						*974*	
v/c	*0.01*						*0.20*	
95% queue length	*0.03*						*0.75*	
Control Delay	*7.4*						*9.6*	
LOS	*A*						*A*	
Approach Delay	--	--				*9.6*		
Approach LOS	--	--				*A*		

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*NJC*	Intersection	*SR-177 / I-10 EB Off Ramp*
Agency/Co.	*Hernandez, Kroone & Associates*	Jurisdiction	
Date Performed	*1/24/2012*	Analysis Year	*Const&Cumulative wo Project*
Analysis Time Period	*AM*		
Project Description *11-1027*			
East/West Street: *I-10 EB Off Ramp*		North/South Street: *SR-177*	
Intersection Orientation: *North-South*		Study Period (hrs): *0.25*	

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*2*	*6*	*39*	*7*	*0*
Peak-Hour Factor, PHF	*0.83*	*0.83*	*0.83*	*0.83*	*0.83*	*0.83*
Hourly Flow Rate, HFR	*0*	*2*	*7*	*46*	*8*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*0*	*85*	*3*	*25*
Peak-Hour Factor, PHF	*0.83*	*0.83*	*0.83*	*0.83*	*0.83*	*0.83*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*102*	*3*	*30*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*1*
Lanes	*0*	*0*	*0*	*1*	*1*	*1*
Configuration				*L*	*T*	*R*

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*				*L*	*T*	*R*
v (vph)		*46*				*102*	*3*	*30*
C (m) (vph)		*1624*				*872*	*763*	*1080*
v/c		*0.03*				*0.12*	*0.00*	*0.03*
95% queue length		*0.09*				*0.40*	*0.01*	*0.09*
Control Delay		*7.3*				*9.7*	*9.7*	*8.4*
LOS		*A*				*A*	*A*	*A*
Approach Delay	--	--				*9.4*		
Approach LOS	--	--				*A*		

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*NJC*	Intersection	*SR-177 / I-10 EB Off Ramp*
Agency/Co.	*Hernandez, Kroone & Associates*	Jurisdiction	
Date Performed	*12/2/2011*	Analysis Year	*Const&Cumulative wo Project*
Analysis Time Period	*PM*		
Project Description	*11-1027*		
East/West Street:	*I-10 EB Off Ramp*	North/South Street:	*SR-177*
Intersection Orientation:	*North-South*	Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*9*	*2*	*29*	*3*	*0*
Peak-Hour Factor, PHF	*0.97*	*0.97*	*0.97*	*0.97*	*0.97*	*0.97*
Hourly Flow Rate, HFR	*0*	*9*	*2*	*29*	*3*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*0*	*93*	*10*	*3*
Peak-Hour Factor, PHF	*0.97*	*0.97*	*0.97*	*0.97*	*0.97*	*0.97*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*95*	*10*	*3*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*1*
Lanes	*0*	*0*	*0*	*1*	*1*	*1*
Configuration				*L*	*T*	*R*

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*				*L*	*T*	*R*
v (vph)		*29*				*95*	*10*	*3*
C (m) (vph)		*1621*				*921*	*807*	*1087*
v/c		*0.02*				*0.10*	*0.01*	*0.00*
95% queue length		*0.05*				*0.34*	*0.04*	*0.01*
Control Delay		*7.3*				*9.4*	*9.5*	*8.3*
LOS		*A*				*A*	*A*	*A*
Approach Delay	--	--				*9.3*		
Approach LOS	--	--				*A*		

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*NJC*	Intersection	*SR-177 / I-10 WB OFF RAMP*
Agency/Co.	*HERNANDEZ KROONE & ASSOCIATES*	Jurisdiction	
Date Performed	*1/24/2012*	Analysis Year	*Const&Cumulative wo Project*
Analysis Time Period	*AM*		

Project Description	*11-1027*		
East/West Street:	*I-10 WB OFF RAMP*	North/South Street:	*SR-177*
Intersection Orientation:	*North-South*	Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*87*	*0*	*0*	*39*	*71*
Peak-Hour Factor, PHF	*0.81*	*0.81*	*0.81*	*0.81*	*0.81*	*0.81*
Hourly Flow Rate, HFR	*0*	*107*	*0*	*0*	*48*	*87*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*7*	*8*	*56*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.81*	*0.81*	*0.81*	*0.81*	*0.81*	*0.81*
Hourly Flow Rate, HFR	*8*	*9*	*69*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*0*	*0*
Configuration		*LTR*				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*			*LTR*				
v (vph)	*0*			*86*				
C (m) (vph)	*1462*			*895*				
v/c	*0.00*			*0.10*				
95% queue length	*0.00*			*0.32*				
Control Delay	*7.5*			*9.4*				
LOS	*A*			*A*				
Approach Delay	--	--	*9.4*					
Approach LOS	--	--	*A*					

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*NJC*	Intersection	*SR-177 / I-10 WB OFF RAMP*
Agency/Co.	*HERNANDEZ KROONE & ASSOCIATES*	Jurisdiction	
Date Performed	*1/23/2012*	Analysis Year	*Const&Cumulative wo Project*
Analysis Time Period	*PM*		

Project Description *11-1027*	
East/West Street: *I-10 WB OFF RAMP*	North/South Street: *SR-177*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*6*	*97*	*0*	*0*	*31*	*103*
Peak-Hour Factor, PHF	*0.85*	*0.85*	*0.85*	*0.85*	*0.85*	*0.85*
Hourly Flow Rate, HFR	*7*	*114*	*0*	*0*	*36*	*121*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*3*	*14*	*32*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.85*	*0.85*	*0.85*	*0.85*	*0.85*	*0.85*
Hourly Flow Rate, HFR	*3*	*16*	*37*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*0*	*0*
Configuration		*LTR*				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*			*LTR*				
v (vph)	*7*			*56*				
C (m) (vph)	*1435*			*815*				
v/c	*0.00*			*0.07*				
95% queue length	*0.01*			*0.22*				
Control Delay	*7.5*			*9.7*				
LOS	*A*			*A*				
Approach Delay	--	--	*9.7*					
Approach LOS	--	--	*A*					

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	NJC	Intersection	SR-177 / KAISER ROAD
Agency/Co.	HERNANDEZ, KROONE & ASSOCIATES	Jurisdiction	
Date Performed	1/25/2012	Analysis Year	Const&Cumulative wo Project
Analysis Time Period	AM		

Project Description	11-1027		
East/West Street:	KAISER ROAD	North/South Street:	SR-177
Intersection Orientation:	North-South	Study Period (hrs):	0.25

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	71	41	0	0	25	2
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	78	45	0	0	27	2
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	0	0	0	0	0	51
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	0	0	0	0	0	56
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LR	
v (vph)	78						56	
C (m) (vph)	1597						1053	
v/c	0.05						0.05	
95% queue length	0.15						0.17	
Control Delay	7.4						8.6	
LOS	A						A	
Approach Delay	--	--				8.6		
Approach LOS	--	--				A		

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*NJC*	Intersection	*SR-177 / KAISER ROAD*
Agency/Co.	*HERNANDEZ, KROONE & ASSOCIATES*	Jurisdiction	
Date Performed	*1/25/2012*	Analysis Year	*Const&Cumulative wo Project*
Analysis Time Period	*PM*		
Project Description *11-1027*			
East/West Street: *KAISER ROAD*		North/South Street: *SR-177*	
Intersection Orientation: *North-South*		Study Period (hrs): *0.25*	

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*10*	*94*	*0*	*0*	*62*	*2*
Peak-Hour Factor, PHF	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*
Hourly Flow Rate, HFR	*13*	*125*	*0*	*0*	*82*	*2*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*0*	*0*	*0*	*26*
Peak-Hour Factor, PHF	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*0*	*0*	*34*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (vph)	*13*						*34*	
C (m) (vph)	*1526*						*982*	
v/c	*0.01*						*0.03*	
95% queue length	*0.03*						*0.11*	
Control Delay	*7.4*						*8.8*	
LOS	*A*						*A*	
Approach Delay	--	--				*8.8*		
Approach LOS	--	--				*A*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*NJC*	Intersection	*SR-177 / I-10 EB Off Ramp*
Agency/Co.	*Hernandez, Kroone & Associates*	Jurisdiction	
Date Performed	*1/24/2012*	Analysis Year	*Const&Cumulative w Project*
Analysis Time Period	*AM*		
Project Description *11-1027*			
East/West Street: *I-10 EB Off Ramp*		North/South Street: *SR-177*	
Intersection Orientation: *North-South*		Study Period (hrs): *0.25*	

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*2*	*6*	*57*	*7*	*0*
Peak-Hour Factor, PHF	*0.83*	*0.83*	*0.83*	*0.83*	*0.83*	*0.83*
Hourly Flow Rate, HFR	*0*	*2*	*7*	*68*	*8*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*0*	*169*	*3*	*25*
Peak-Hour Factor, PHF	*0.83*	*0.83*	*0.83*	*0.83*	*0.83*	*0.83*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*203*	*3*	*30*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*1*
Lanes	*0*	*0*	*0*	*1*	*1*	*1*
Configuration				*L*	*T*	*R*

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*				*L*	*T*	*R*
v (vph)		*68*				*203*	*3*	*30*
C (m) (vph)		*1624*				*812*	*711*	*1080*
v/c		*0.04*				*0.25*	*0.00*	*0.03*
95% queue length		*0.13*				*0.99*	*0.01*	*0.09*
Control Delay		*7.3*				*10.9*	*10.1*	*8.4*
LOS		*A*				*B*	*B*	*A*
Approach Delay	--	--				*10.6*		
Approach LOS	--	--				*B*		

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*NJC*	Intersection	*SR-177 / I-10 EB Off Ramp*
Agency/Co.	*Hernandez, Kroone & Associates*	Jurisdiction	
Date Performed	*1/24/2012*	Analysis Year	*Const&Cumulative w Project*
Analysis Time Period	*PM*		
Project Description	*11-1027*		
East/West Street:	*I-10 EB Off Ramp*	North/South Street:	*SR-177*
Intersection Orientation:	*North-South*	Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*9*	*2*	*63*	*3*	*0*
Peak-Hour Factor, PHF	*0.97*	*0.97*	*0.97*	*0.97*	*0.97*	*0.97*
Hourly Flow Rate, HFR	*0*	*9*	*2*	*64*	*3*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*0*	*93*	*10*	*3*
Peak-Hour Factor, PHF	*0.97*	*0.97*	*0.97*	*0.97*	*0.97*	*0.97*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*95*	*10*	*3*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*1*
Lanes	*0*	*0*	*0*	*1*	*1*	*1*
Configuration				*L*	*T*	*R*

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*				*L*	*T*	*R*
v (vph)		*64*				*95*	*10*	*3*
C (m) (vph)		*1621*				*823*	*723*	*1087*
v/c		*0.04*				*0.12*	*0.01*	*0.00*
95% queue length		*0.12*				*0.39*	*0.04*	*0.01*
Control Delay		*7.3*				*9.9*	*10.0*	*8.3*
LOS		*A*				*A*	*B*	*A*
Approach Delay	--	--				*9.9*		
Approach LOS	--	--				*A*		

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*NJC*	Intersection	*SR-177 / I-10 WB OFF RAMP*
Agency/Co.	*HERNANDEZ KROONE & ASSOCIATES*	Jurisdiction	
Date Performed	*1/24/2012*	Analysis Year	*Const&Cumulative w Project*
Analysis Time Period	*AM*		

Project Description	*11-1027*		
East/West Street:	*I-10 WB OFF RAMP*	North/South Street:	*SR-177*
Intersection Orientation:	*North-South*	Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*171*	*0*	*0*	*57*	*75*
Peak-Hour Factor, PHF	*0.81*	*0.81*	*0.81*	*0.81*	*0.81*	*0.81*
Hourly Flow Rate, HFR	*0*	*211*	*0*	*0*	*70*	*92*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*7*	*8*	*108*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.81*	*0.81*	*0.81*	*0.81*	*0.81*	*0.81*
Hourly Flow Rate, HFR	*8*	*9*	*133*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*0*	*0*
Configuration		*LTR*				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*			*LTR*				
v (vph)	*0*			*150*				
C (m) (vph)	*1429*			*800*				
v/c	*0.00*			*0.19*				
95% queue length	*0.00*			*0.69*				
Control Delay	*7.5*			*10.5*				
LOS	*A*			*B*				
Approach Delay	--	--	*10.5*					
Approach LOS	--	--	*B*					

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*NJC*	Intersection	*SR-177 / I-10 WB OFF RAMP*
Agency/Co.	*HERNANDEZ KROONE & ASSOCIATES*	Jurisdiction	
Date Performed	*1/24/2012*	Analysis Year	*Const&Cumulative w Project*
Analysis Time Period	*PM*		

Project Description	*11-1027*		
East/West Street:	*I-10 WB OFF RAMP*	North/South Street:	*SR-177*
Intersection Orientation:	*North-South*	Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*6*	*97*	*0*	*0*	*65*	*187*
Peak-Hour Factor, PHF	*0.85*	*0.85*	*0.85*	*0.85*	*0.85*	*0.85*
Hourly Flow Rate, HFR	*7*	*114*	*0*	*0*	*76*	*219*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*3*	*14*	*32*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.85*	*0.85*	*0.85*	*0.85*	*0.85*	*0.85*
Hourly Flow Rate, HFR	*3*	*16*	*37*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*0*	*0*
Configuration		*LTR*				

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*			*LTR*				
v (vph)	*7*			*56*				
C (m) (vph)	*1278*			*755*				
v/c	*0.01*			*0.07*				
95% queue length	*0.02*			*0.24*				
Control Delay	*7.8*			*10.1*				
LOS	*A*			*B*				
Approach Delay	--	--	*10.1*					
Approach LOS	--	--	*B*					

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	NJC	Intersection	SR-177 / KAISER ROAD
Agency/Co.	HERNANDEZ, KROONE & ASSOCIATES	Jurisdiction	
Date Performed	1/24/2012	Analysis Year	Const&Cumulative w Project
Analysis Time Period	AM		

Project Description	11-1027		
East/West Street:	KAISER ROAD	North/South Street:	SR-177
Intersection Orientation:	North-South	Study Period (hrs):	0.25

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	207	41	0	0	25	6
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	230	45	0	0	27	6
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	0	0	0	0	0	71
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	0	0	0	0	0	78
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LR	
v (vph)	230						78	
C (m) (vph)	1592						1050	
v/c	0.14						0.07	
95% queue length	0.51						0.24	
Control Delay	7.6						8.7	
LOS	A						A	
Approach Delay	--	--				8.7		
Approach LOS	--	--				A		

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*NJC*	Intersection	*SR-177 / KAISER ROAD*
Agency/Co.	*HERNANDEZ, KROONE & ASSOCIATES*	Jurisdiction	
Date Performed	*1/24/2012*	Analysis Year	*Const&Cumulative w Project*
Analysis Time Period	*PM*		

Project Description *11-1027*	
East/West Street: *KAISER ROAD*	North/South Street: *SR-177*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*10*	*94*	*0*	*0*	*62*	*2*
Peak-Hour Factor, PHF	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*
Hourly Flow Rate, HFR	*13*	*125*	*0*	*0*	*82*	*2*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*0*	*4*	*0*	*144*
Peak-Hour Factor, PHF	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*	*0.75*
Hourly Flow Rate, HFR	*0*	*0*	*0*	*5*	*0*	*192*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (vph)	*13*						*197*	
C (m) (vph)	*1526*						*974*	
v/c	*0.01*						*0.20*	
95% queue length	*0.03*						*0.75*	
Control Delay	*7.4*						*9.6*	
LOS	*A*						*A*	
Approach Delay	--	--				*9.6*		
Approach LOS	--	--				*A*		

Appendix I

Cultural Resources – Tribal Contact List

Desert Harvest Tribal Contact List

Richard Milanovich, Chairman
Agua Caliente Band of Cahuilla Indians
5401 Dinah Shore Drive
Palm Springs, CA 92264

Mary Ann Green, Chairwoman
Augustine Band of Cahuilla Indians
P.O. Box 846
Coachella, CA 92236

David Roosevelt, Chairman
Cabazon Band of Mission Indians
84-245 Indio Springs Parkway
Indio, CA 92203-3449

Charles Wood, Chairman
Chemehuevi Indian Tribe
P.O. Box 1976
Havasu Lake, CA 92363

Sherry Cordova, Chairwoman
Cocopah Indian Tribe
14515 S. Veterans Dr
Somerton, AZ 85350

Eldred Enas, Chairman
Colorado River Indian Tribes
26600 Mohave Road
Parker, AZ 85344

Timothy Williams, Chairman
Fort Mojave Indian Tribe
500 Merriman Avenue
Needles, CA 92363

Keeny Escalanti, Sr., President
Fort Yuma Quechan Tribe
P.O. Box 1899
Yuma, AZ 85366-1899

Robert Martin, Chairman
Morongo Band of Mission Indians
12700 Pumarra Rd.
Banning, CA 92220

Mary Resvaloso, Chairwoman
Torres-Martinez Desert Cahuilla Indians
P.O. Box 1160
Thermal, CA 92274

Darrell Mike, Spokesman
Twenty-nine Palms Band of Mission Indians
46-200 Harrison Place
Coachella, CA 92236

Appendix J

Memorandum of Understanding between BLM and the National Park Service

February 24, 2011

Area where NPS and BLM are in complete agreement.

1. Scale back the footprint of the Desert Sunlight project to 4000 acres or less. Should Desert Sunlight or enXco Eagle Mtn Soliel not be developed, these areas will be withdrawn from future development.

2. Require First Solar (Desert Sunlight) to mitigate impacts to the park from its facility, including impacts to viewshed, air quality, natural sounds, wildlife, dark night skies, in close coordination with the NPS. Mitigation agreed on with the NPS will be included in the ROD.

3. Transfer the following BLM lands to the NPS: 1) the key hole at Mojave (i.e., the Viceroy Mine), 2) the "bowling alley" between Death Valley and Fort Irwin in CA (i.e., this is a narrow strip between the park and the military base and contains metal fragments from past bombing operations and the agencies will assure that liability issues are addressed), 3) the "saddle area" of Joshua Tree NP.

4. Companies seeking to site projects and any associated ancillary facilities within the viewshed or that could affect other resources or values of a unit of the National Park System will be deemed high conflict projects in accordance with the BLM pre-application and screening criteria set forth in the IMs. During the pre-application and screening process, the NPS will provide expertise and documentation of adverse impacts to park resources and values and in development or review of mitigation measures. If a proposal does not avoid areas where development would cause significant impacts to sensitive resources and values that are the basis of special designations or protections, the BLM may exercise its discretion to not accept and to reject the application.

5. Require a dedicated section in all renewable energy and transmission NEPA documents that addresses direct, indirect and cumulative impacts on units of National Park System or other areas under NPS management (like a national trail).

6. Companies seeking to site projects and any associated ancillary facilities in areas proposed for transfer to the NPS in the Feinstein legislation will be deemed high conflict projects in accordance with the BLM screening criteria set forth in the IMs. BLM will advise current wind testing row grant holders that any subsequent testing or development application would be treated as a high conflict application. If a proposal does not avoid areas where development would cause significant impacts to sensitive resources and values that are the basis of special designations or protections, the BLM may exercise its discretion to not accept and to reject the application.

7. In the Solar PEIS, preclude any additional renewable energy development projects on those lands excluded from the Desert Sunlight and enXco Eagle Mtn Soliel application footprints.

8. In the Solar PEIS reconfigure SEZs boundaries to exclude land near National Park Service units, including Joshua Tree NP. NPS and BLM will work together to determine these exclusion areas.

9. With respect to the Eagle Crest Energy Pumped Storage Project, agree to file an Intervention on the project in order to protect Joshua Tree NP.

Areas where BLM and NPS will continue to work closely together to protect park resources

1. Jointly address any new transmission line applications across Joshua Tree NP. The NPS understands that the Metropolitan Water Authority may have legislated rights on that ROW that may supercede any NPS or BLM authority.

2. Work closely with NPS to mitigate, move, or deny new transmission lines visible from key observations points as identified by the NPS with the exception of nationally designated corridors.

3. BLM will continue to work closely with the NPS to eliminate groundwater use within the Amargosa Valley through dry technology project requirements, advocating acquisition and retiring of existing groundwater allocations within the basin or other activities to eliminate water use in projects in the Amargosa Valley.

4. Understanding that the Eagle Mountain landfill on BLM lands near Joshua Tree NP is currently in litigation, once that litigation is settled, work closely with NPS to protect the resources of park.

2/24/2011

2/24/2011

Appendix K

Cabazon Band Consultation Letter

June 15, 2012

Tiffany Thomas, Archaeologist
Bureau of Land Management
Renewable Energy Coordination Office
22835 Calle San Juan de los Lagos
Moreno Valley, CA 92553

Re.: Native American Consultation for EnXco Development Corporation's Desert Harvest Solar Farm Project and Transmission Line, Riverside County, California
LLCAD06000
CACA-49491/2800(P)

Dear Ms. Thomas:

Thank you for contacting the Cabazon Band of Mission Indians regarding the above referenced project.

We remain an interested party and do appreciate the offer to consult on a Government-to-Government basis at any time in the future on this project.

We look forward to continued collaboration in the preservation of cultural resources or areas of traditional cultural importance.

Sincerely,

Judy Stapp

Judy Stapp
Director of Cultural Affairs

Cc: David Roosevelt, Chairman
Cabazon Band of Mission Indians

John R. Kalish, Field Manager
Bureau of Land Management

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Appendix L

Memorandum of Understanding between BLM and the County of Riverside

SUBMITTAL TO THE BOARD OF SUPERVISORS
COUNTY OF RIVERSIDE, STATE OF CALIFORNIA 901

FROM: Planning Department

SUBMITTAL DATE:
April 12, 2012

SUBJECT: Memorandum of Understanding between the Bureau of Land Management (BLM) and County of Riverside regarding coordinated environmental review for the Desert Harvest Solar Project.

RECOMMENDED MOTION:

1. Approve the Memorandum of Understanding ("MOU") between the Bureau of Land Management (BLM) and County of Riverside regarding coordinated environmental review for the Desert Harvest Solar Project.

2. Authorize the Chairman of the Board to execute the attached Memorandum of Understanding.

Carolyn Syms Luna
Carolyn Syms Luna, Planning Director

(Continued on attached page)

FINANCIAL DATA	**Current F.Y. Total Cost:**	$ N/A	**In Current Year Budget:**	YES
	Current F.Y. Net County Cost:	$ N/A	**Budget Adjustment:**	NO
	Annual Net County Cost:	$ N/A	**For Fiscal Year:**	2011/2012

SOURCE OF FUNDS: Deposit-based fees.

Positions To Be Deleted Per A-30 ☐

Requires 4/5 Vote ☐

C.E.O. RECOMMENDATION: Approve as presented without the referenced schedule of deadlines.

APPROVE

County Executive Office Signature

BY: Denise C. Harden

Departmental Concurrence

FORM APPROVED COUNTY COUNSEL
BY: TIFFANY N. NORTH 5/24/12
DATE

☐ Consent ☒ Policy
Dep't Recomm.:

☐ Consent ☑ Policy
Per Exec. Ofc.:

MINUTES OF THE BOARD OF SUPERVISORS

On motion of Supervisor Tavaglione, seconded by Supervisor Benoit and duly carried by unanimous vote, IT WAS ORDERED that the above matter is approved as recommended and IT WAS FURTHER ORDERED that the Executive Office's recommendation is incorporated herein.

Ayes:	Buster, Tavaglione, Stone, Benoit and Ashley
Nays:	None
Absent:	None
Date:	June 5, 2012
xc:	Planning

Kecia Harper-Ihem
Clerk of the Board
By: Deputy

Prev. Agn. Ref. | **District:** 4/4 | **Agenda Number:** 3.49

ATTACHMENTS FILED
WITH THE CLERK OF THE BOARD

Revised 2/2011

BACKGROUND:

enXco Development Corporation ("enXco") proposes to construct and operate a 150 megawatt (MW) solar photovoltaic (PV) energy-generating project known as the Desert Harvest Project ("Project"). The majority of the Project, including the solar power plant, will be located on Federal land managed by BLM. The solar power plant is not within the County's jurisdiction. The Project includes construction of a 12 mile generation transmission intertie line ("Gen-Tie") connecting the electrical output of the solar power plant to Southern California Edison's proposed Red Bluff Substation. A portion of the Gen-Tie will run under, along, across or upon the Kaiser Road rights-of-way and other areas within the County's jurisdiction.

enXco has applied for a Public Use Permit (PUP 914) pursuant to Ordinance No. 348. Other discretionary approvals by the County required for the Project include an encroachment permit and franchise pursuant to Ordinance No. 499 for the parts of the Project within the County's jurisdiction. Ordinance No. 499 provides that an encroachment permit may be issued if the applicant holds a current County franchise. The County is authorized to grant a franchise pursuant to Article 11, Section 7, of the California Constitution and Government Code Section 26001. The Project is also subject to the requirements of Board of Supervisors Policy B-29.

The Project requires environmental review under both the federal National Environmental Policy Act ("NEPA") and the California Environmental Quality Act ("CEQA"). The purpose of the MOU is to provide a framework for cooperation between the BLM and the County to work together in preparing and completing a joint environmental analysis and document that complies with NEPA and CEQA and to ensure the County's concerns are incorporated into the Project review.

FISCAL:
There are no financial impacts to the County associated with this item, as any applicable costs will be fully funded by the Project applicant.

MEMORANDUM OF UNDERSTANDING
between
THE BUREAU OF LAND MANAGEMENT
and
COUNTY OF RIVERSIDE

This MEMORANDUM OF UNDERSTANDING (MOU) is hereby entered into between the Bureau of Land Management, hereinafter referred to as the BLM, and the County of Riverside, hereinafter referred to as the County. The BLM and County are hereinafter referred together as the Parties.

A. INTRODUCTION and PURPOSE:

enXco Development Corporation (enXco) is proposing to build the 150 megawatt (MW) Desert Harvest Project, a solar photovoltaic energy generating facility including a 12 mile generation transmission intertie (Gen-Tie) line to the Red Bluff Substation (hereinafter referred to as "Project"). The 150 MW solar power plant site is entirely on federal land but the Gen-Tie would be within County road rights-of-way and other areas within the County's jurisdiction. The federal lands are subject to BLM jurisdiction, and enXco has applied for rights-of-way associated with the relevant federal lands pursuant to BLM regulations.

Because the County is required to make discretionary decisions to determine if enXco can construct the Gen-Tie, in accordance with California Environmental Quality Act (CEQA) guidelines, CEQA is triggered. Such discretionary decisions include a public use permit, franchise agreement or other similar development agreement, and encroachment permits. The BLM will begin preparing an Environmental Impact Statement (EIS) in September 2011 in compliance with 1508.11 of the National Environmental Policy Act of 1969 (NEPA), CEQA Statutes Section 21061 and CEQA Guidelines Sections 15120 to 15132, 15221, and all other applicable laws, executive orders, regulations, and direction. The BLM personnel will work with County staff to include discussion of the Gen-Tie elements, and write the EIS in a manner that complies with both CEQA and NEPA.

The purpose of this MOU is to provide a framework for cooperation between the BLM and the County to work together as lead agency and cooperating agency, in that order, in preparing and completing a joint environmental analysis and document that is in compliance with NEPA, CEQA, and all applicable laws, executive orders, regulations, direction, and guidelines. Work would include, but is not limited to, environmental and technical information collection, analysis and reporting. This Memorandum of Understanding includes meetings and/or conference calls as necessary for planning, information sharing, gathering and incorporating comments to the draft EIS to ensure CEQA compliance. Should the decision be made to authorize the Project, this Memorandum of Understanding continues the cooperation during construction of the Project, applying in particular to the Gen-Tie, and including the implementation of the mitigation measures and monitoring developed through the NEPA process. This cooperation serves the mutual interest of the Parties and the public.

B. STATEMENT OF MUTUAL BENEFIT AND INTERESTS:

The Council on Environmental Quality (CEQ) regulations (40 CFR 1506.2) direct federal agencies to cooperate with State and local agencies to the fullest extent possible to reduce duplication between NEPA and State and local requirements, including joint planning processes, environmental research and studies, public hearings, and environmental impact statements. The CEQ regulations (40 CFR 1501.6) provide for and describe both lead and cooperating agency status, and emphasize agency cooperation early in the NEPA process. For the purposes of this effort, BLM will be the lead agency developing one document in coordination with the County acting as Cooperating Agency. County will retain its approval authority for all aspects of the project within its jurisdiction. CEQA Statutes Section 21083.7 and CEQA Guidelines

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Sections 15221and 15226 encourage similar cooperation by state and local agencies with federal agencies when environmental review is required under both CEQA and NEPA.

This MOU meets the intent of these regulations and provides guidance on the roles each agency will take. In consideration of the above premises, the Parties agree as follows:

C. BLM SHALL:

1. As lead Federal agency, be responsible for ensuring compliance with the requirements of NEPA, and the CEQ, and BLM regulations implementing NEPA, along with all applicable federal laws, executive orders, regulations and direction, and shall be responsible for the EIS and the scope and content of the portion of the EIS that relates to all necessary federal law and regulatory requirements;

2. Provide to the County for review and comment a draft of the Project Description and Alternatives section as soon as they are available to ensure that adequate detail is included to support County's review, analysis, and decisions;

3. Provide the administrative draft of the EIS to the County for its review and comment prior to the release of the public draft;

4. Schedule meetings as necessary with the County to discuss status updates, related findings, schedules and planning associated with the EIS;

5. Ensure that the BLM approved EIS contractor will complete the environmental analysis and prepare the EIS in a form and in substance that is consistent with this MOU and agreeable to the Parties;

6. Act as the intermediary, when necessary, for communications between the County and the EIS contractor related to the EIS;

7. Provide updated mailing lists to the EIS contractor for distributing the public notice of availability of the EIS to the public and to other Federal, State, and local agencies as required by law. The BLM shall provide updated mailing lists of the EIS, and Record of Decision to the public and to other Federal, State, and local agencies as required by law;

8. Publish the Notice of Intent (NOI) in the Federal Register and work with the EIS contractor to develop other public notices, and Notice of Availability of the document and ensure publication in appropriate periodicals;

9. Ensure that the contract with the EIS contractor incorporates the condition that the contractor will provide all graphic handouts and presentations for public meetings/hearings. The EIS contractor shall submit any such graphic presentations and/or handouts to the BLM for approval prior to distributing them at public meetings/hearings;

10. Be responsible for conducting public meetings and provide County with sufficient advanced noticed of these hearings so that the County can attend in a cooperating role;

II. Use its best efforts to ensure that the contract with the EIS contractor incorporates all of the following conditions:

(a) The EIS contractor agrees to defend, hold harmless and indemnify the BLM and County with respect to any and all claims, demands, cause(s) of action, and liabilities which may arise from the contractor's performance, purchases, or services utilized in the preparation of the EIS.

(b) The EIS contractor will sign a disclosure statement specifying that they have no financial or other interest in the outcome of the Project.

(c) The EIS contractor shall cooperate in defense of any appeal and/or suit involving the legality or adequacy of the BLM's or County's compliance with NEPA or CEQA with regard to this EIS.

(d) The EIS contractor will be responsible for all stenographic, clerical, graphics, layout, printing, and like work.

(f) The EIS contractor shall produce an internal administrative Draft EIS for review by the BLM and County prior to publication of the Draft EIS. The administrative draft shall include all text, maps, appendices, tables, charts, and other materials that will be incorporated in the Draft EIS for publication. As determined by both the BLM and County, the contractor shall provide a reasonable number of copies to each party to meet internal review needs.

(g) The Draft EIS will include evaluation of potential Gen-Tie routes, alternative designs, and impacts. The Draft and Final EIS will apply whichever NEPA and CEQA requirement is more stringent in the analysis. The Draft and Final EIS will describe any inconsistencies between Federal plans or laws as they pertain to the proposed action and describe the extent to which the BLM would reconcile the proposed action with the plan or law.

(h) Subject to Parties' comments during the environmental analysis and responses to the administrative Draft and Final EIS, the EIS contractor shall have primary responsibility for writing and rewriting all sections, parts, and chapters of the EIS.

(i) The County is a third-party beneficiary to the contract with the EIS contractor with the right to enforce contract provisions affecting the County's interests.

12. Provide oversight to the EIS contractor in filing the Draft and Final EIS with the U.S. Environmental Protection Agency (US EPA).

13. Reserve the right to prepare, at its option, selected sections of the Administrative Draft and/or Final EIS; as appropriate, the BLM will provide such prepared material in a time and manner consistent;

14. Be responsible for consulting with the United States Fish and Wildlife Service for a Section 7 Consultation and the California State Historic Preservation Officer for a Section 106 Consultation regarding proposed federal action; at the discretion of the BLM, the consultant shall furnish such data or information required to accomplish such consultation; the BLM shall include County staff in these meetings and discussions; act as the lead for Native American consultation;

15. As required, the BLM will be responsible for consulting with the California Department of Fish and Game;

16. Should the decision be made to authorize the Project, BLM and the County will jointly define appropriate field inspection responsibilities for ensuring implementation of the mitigation and monitoring activities adopted in the Record of Decision for the Gen-Tie portion of the project; and,

17. To the extent that CEQA or NEPA guidelines may preclude, or are potentially inconsistent with, construction of the proposed Project that is the subject of this MOU, the BLM will identify such potential inconsistencies at the beginning of the EIS process, and shall collaborate with the County and the contractor to ensure that sufficient information is collected during the course of the environmental assessment process to allow the BLM to begin an EIS for the Project to remove such inconsistencies and allow the Project to be carried forward.

D. COUNTY SHALL:

1. As the cooperating CEQA agency, be responsible to ensure that the EIS is in compliance with all requirements of CEQA and shall be responsible for the scope and content of the EIS that relates to all necessary aspects of CEQ A.

2. Should the level of detail in the EIS be insufficient in meeting CEQA standards, the BLM will continue the EIS development, and the County will perform a Environmental Impact Report or Mitigated Negative Declaration (whichever is required) separately, hiring its own consultants.

E. IT IS MUTUALLY AGREED AND UNDERSTOOD BY ALL PARTIES THAT:

1. Schedule of Deadlines. The BLM intends to make a decision on the Final EIS by August 6, 2012. Both Parties will attempt to meet this timeframe. Attached to this MOU is a draft detailed schedule, which the Parties intend to serve as a template for the actual schedule of deadlines that they intend to adhere to in completing the environmental review that is the subject of this MOU. The parties agree to modify and reach final agreement on the details of this draft schedule, which will include specific dates establishing the deadlines for expected deliverables from the BLM/project proponent's contractor, as well as deadlines for the BLM and the County to respond to all materials provided by the BLM/project proponent's contractor, *within one month.* Once the details of this schedule are agreed to, the Parties shall undertake their best efforts to comply with *all* deadlines set forth in said schedule.

2. Contractor Selection. The project proponent's EIS contractor, Aspen Environmental Group, will be used for the preparation of the EIS. Aspen Environmental Group is on the County's list of qualified Environmental Impact Report consulting firms.

3. Agency Project Representatives. For the purpose of coordinating the responsibilities of the Parties for the preparation of the EIS on the Project, the persons listed below are the designated Agency Project Representatives of the Parties. Actual delivery of written notice to the following representatives, or such substitute representatives as the respective Parties may hereinafter designate, shall constitute notice to that organization. The principal contacts for this instrument are:

BLM	County Representative
Name: Lynnette A. Elser	Name: Greg Neal, Deputy Planning Director
Title: Project Manager	Agency: Planning Department, County of Riverside
Address: 22835 Calle San Juan De Los Lagos	Address: 4080 Lemon Street, 12th Flr.
Address: Moreno Valley, CA 92553	Address: PO Box 1409, Riverside, CA 92501
Phone: (951) 697- 5387	Phone: (951) 955-3200
FAX: (951) 697- 5299	FAX: (951) 955-1817
E-Mail: lelser@blm.gov	E-Mail: GNEAL@rctlma.org

4. Regular Consultation between Parties. The successful preparation of the EIS requires complete and full communication between all Parties involved. It is the duty of the Agency Project Representatives to ensure close consultation throughout the document preparation and review process. Accordingly:

(a) The Agency Project Representatives shall keep each other advised of the developments affecting the preparation of the Draft EIS. Toward this end, and to ensure close consultation and coordination, the Agency Project Representatives shall conduct conference calls as necessary and shall meet face-to-face at least once every two months or as deemed necessary.

(b) In the event that either Agency Project Representative is unable to participate in any such regularly scheduled conference call or meeting, an alternate shall be delegated to represent that Agency Project Representative's party in said call or meeting.

(c) The BLM recognizes the need for the County to work directly with the EIS contractor with regard to the Gen-Tie and CEQA requirements. The County will keep the BLM informed of these discussions and will involve the BLM when appropriate.

(d) Consistent with existing laws and regulations, the Parties agree to share all relevant information.

(e) Any and all media releases and/or public mail-outs shall be made with the joint approval and at the direction of the BLM and the County.

5. Scope and Content of the EIS. The BLM and the EIS contractor shall schedule and conduct scoping meetings at the beginning of the process. These meetings will be held to determine the areas of public and agency concerns pertaining to the proposed Project, and guide the Parties in scoping the EIS. The BLM in coordination with the County as a cooperating agency shall determine the final scope of the EIS. The Agency Project Representatives shall determine (with approval, if necessary, from the signatories to this MOU or their delegates):

(a) The scope and content of the EIS for the Project to ensure that the requirements of the various federal and state statutes (i.e. - NEPA, CEQA, County standards and policies) are met and that the statutory findings required of the BLM and County for their respective decisions on the Project can be made;

(b) Whether the work performed by the EIS contractor is satisfactory, and if not, how best to correct the deficiencies in the work; and

(c) The division of responsibilities among lead agencies and cooperating agencies.

6. County Revisions. County may request revision of the administrative draft with further agency review.

7. Consultation with Other Agencies. The BLM and County reserve the right to consult directly, without notice or report, with other Federal, State, and local officials regarding their areas of specific responsibility outlined in Section C and D above during the preparation of the EIS to ensure objectivity and compliance with NEPA and CEQA. The Parties will immediately notify each other and the contractor if matters discussed at any such consultation will require significant changes in the development of the EIS or require significant costs pursuant to this Memorandum of Understanding.

8. Privileged and Confidential Information. The BLM and the EIS contractor will, upon request, provide County with procedures and underlying data used in developing submitted sections of the Draft and/or Final EIS including, but not limited to, final reports, subcontractor reports, and interviews with concerned private and public parties, whether or not such information is contained in the working papers or the Draft or Final EIS. The Parties intend that information that is otherwise protected from disclosure under the attorney-client privilege, work-product privilege, and deliberative process privilege and/or any other applicable privilege may be exchanged without waiving or compromising such privileges or doctrines. The Parties agree that privileged information received from the other party shall be treated and maintained as confidential to the extent allowed by federal and state laws, regulations and policies. Parties agree to label as "Confidential" documents that they believe are privileged and should not be disclosed. Neither Party will disclose privileged information received from the other Party, regardless of whether it is labeled "Confidential," without first notifying other Party. The BLM will obtain information that they maintain is confidential directly from BLM.

9. Freedom of Information Act. Any information furnished to the BLM under this Memorandum of Understanding is subject to the Freedom of Information Act (5 U.S.C. 552).

10. Effective Dates. This MOU is executed as of the date of the last signature and is effective through, or the date on which all mitigation measures required in connection with approval of the Project have been fully implemented, whichever date is earlier, at which time it will expire unless extended.

11. Modification. Modifications to this MOU shall be made only by mutual written consent of the Parties, by the issuance of a written instrument, signed and dated by all Parties.

12. Termination. Either of the Parties, in writing, may terminate this MOU in whole, or in part, at any time before the date of expiration upon 30 days written notice to the other party. During any such 30-day waiting period, the Parties will actively attempt to resolve any disagreement between them. In the event of termination of this MOU, both the BLM and County shall have access to all documentation, reports, analyses, and data developed by the contractor.

13. Rights and Responsibilities of Parties. This MOU sets forth the Parties' rights and responsibilities for preparing the EIS, and for subsequent activities related to the document. This MOU in no way restricts the BLM or the County from participating in similar activities with other public or private agencies, organizations, and individuals. This MOU does not authorize the transfer of funds between parties. Each Party is responsible for its own acts and omissions in collection with activities undertaken pursuant to this MOU.

THE PARTIES HERETO have executed this instrument

Bureau of Land Management

11/2/11
Date

County of Riverside JOHN TAVAGLIONE
CHAIRMAN, BOARD OF SUPERVISORS

6-5-12
Date

FORM APPROVED COUNTY COUNSEL
BY: TIFFANY N. NORTH 5/24/12 DATE

ATTEST:
KECIA HARPER-IHEM, Clerk
By DEPUTY

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